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# Development of the Coach Autonomy Support Beliefs Scale

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### Recommended Citation

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To the Graduate Council:

I am submitting herewith a dissertation written by Johannes Jakob Raabe entitled "Development of the Coach Autonomy Support Beliefs Scale." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Kinesiology and Sport Studies.

Rebecca A. Zakrajsek, Major Professor

We have read this dissertation and recommend its acceptance:

John G. Orme, Leslee A. Fisher, James H. Bemiller

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Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

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Development of the Coach Autonomy Support Beliefs Scale

A Dissertation Presented for the

Doctor of Philosophy

Degree

The University of Tennessee, Knoxville

Johannes Jakob Raabe

May 2016

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## **Acknowledgments**

Thank you to Dr. Rebecca A. Zakrajsek... looking back at my time at The University of Tennessee fills me with great excitement about the amazing mentors I have been fortunate to learn from, the exceptional education I have received, and the development I have experienced as a scholar and teacher. There is no doubt that first and foremost I owe this to you. I could not have asked for a better advisor in my pursuit of a PhD. I appreciate you continuously challenging me to be better, which has helped me develop into the scholar I am today. I believe we have developed a great working relationship and more than that friendship. I am excited to continue what we have started here at The University of Tennessee as colleagues as I begin my professional career.

Thank you to Dr. Tucker Readdy... I cannot express how much I appreciate your continued mentorship and support. Whenever I need advice or guidance you are there for me and I have learned so much from you over the years. You are one of the main reasons I chose to pursue my PhD in Sport Psychology and to seek a faculty position at an institution of higher learning. I consider you one of the biggest influences on my growth as a scholar. You have become a great friend and colleague and I hope we can continue to collaborate on many research projects for years to come.

Thank you to Dr. John G. Orme... for all the time and effort you have invested in the analysis of not only the current research, but other studies as well. You have gone beyond anything that I could have asked for in a committee member and it is much appreciated. Throughout the process I have been able to learn so much about scale development and the statistical analysis. This has been a remarkable opportunity that I will benefit from tremendously as I begin my professional career.

Thank you to Dr. Leslee A. Fisher and Mr. James H. Bemiller... for serving on my dissertation committee and providing valuable feedback and insight that played an essential role in the development of this research.

Thank you to my parents, brother, and grandma... anything I have accomplished in life I owe to you. There is no question that I could have not pursued my PhD or become the person I am today without your continuous support. My entire life you have encouraged me to pursue my aspirations and done everything in your ability to help me realize them. Even when I struggled along the way you never wavered and provided your unconditional support. I love you more than anything else in this world.

## Abstract

Coaches' autonomy support is one of the most meaningful influences on the satisfaction of athletes' basic psychological needs of competence, autonomy, and relatedness (Mageau & Vallerand, 2003). Fostering these needs cultivates self-determined motivation (Deci & Ryan, 2000), which has been found to positively affect individuals' effort, persistence when faced with adversity, performance, performance-related anxiety, and well-being (Gillet, Berjot, & Gobance, 2009; Mack et al., 2011; Podlog & Dionigi, 2010; Vallerand & Losier, 1999). The reasoned action approach (Fishbein & Ajzen, 2010) suggests that coaches' attitude, perceived behavioral control, and perceived norm toward autonomy support influences their use of autonomy-supportive behaviors. However, prior to this study, no instrument has been developed that measured these behavioral antecedents. Consequently, the purpose of the current research was to develop a scale that assesses coaches' attitude, perceived behavioral control, and perceived norm toward autonomy-supportive behaviors when working with student-athletes during practice. Exploratory Factor Analysis procedures with data from 497 National Collegiate Athletic Association Division I and II head coaches' revealed adequate model fit for a two-factor solution ( $RMSEA = .042$ , 99%  $CI$  [.020; .063],  $p = .703$ ;  $CFI = .99$ ). The Autonomy Support Belief Scale (ASBS) is an eight item measure with two subscales: personal belief (five items) and social influence (three items). Subsequent correlation and regression analysis further validated the ASBS. Personal belief and social influence were both found to be statistically significant predictors for coaches' behaviors, accounting for 25.9% and 20.3% of the total variance in participants' use of autonomy-supportive behaviors respectively. The ASBS allows researchers, sport psychology professionals, and coach educators to gain insight into coaches' beliefs about

autonomy supportive behaviors and can help them shape interventions with coaches, evaluate the effectiveness of such programs, and ultimately impact coaches' use of autonomy support.



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## **Section 1: Manuscript**

### **Introduction**

Coaches play a key role in athletes' physical and psychosocial development (Poczwardowski, Barott, & Henschen, 2002) and have a significant impact on their performance (e.g., Horn & Carron, 1985), satisfaction (e.g., Chelladurai, 1993), and persistence (e.g., Pelletier, Fortier, Vallerand, & Briere, 2001). This may stem from the fact that coaches are typically in charge of organizing, educating, advising, and supervising athletes on the teams they work with (Keegan, Spray, Harwood, & Lavallee, 2010). As such, coaches are an integral part of athletes' and sport teams' success. Kalinowski (1985) conducted interviews with Olympic swimmers and concluded that "no one can become an Olympic-calibre [sic] swimmer without the direct support, instruction, and otherwise, of many people [coach]" (p. 140). Similarly, Hemery (1986) interviewed elite athletes from a variety of sports and reported that 68% of all participants felt they would not have been as successful without the support and leadership of their coaches. Therefore, coaches are undeniably in one of the most important roles within the sport environment.

While it may appear that it is primarily athletes who are reliant on their coaches, it should not be neglected that there is a meaningful interdependence within this dyadic relationship. That is, athletes may often depend on their coaches for support, but coaches simultaneously rely on athletes' performance to accomplish competitive success (Lorimer & Jowett, 2009). Therefore, it appears reasonable to suggest that the coach-athlete relationship is one of the most important dyadic pairings in the sport context (Jowett, 2003). As Mike Krzyzewski, Duke University head basketball coach suggested, "almost everything in leadership comes back to relationships"

(Janssen & Dale, 2002, p. 131). Thus, multiple models have been created to better understand the process of building, maintaining, and enhancing coach-athlete relationships.

### **The Motivational Model of the Coach-Athlete Relationship**

Mageau and Vallerand (2003) proposed a model (see Figure 3) that explores the coach-athlete relationship from a motivational perspective. Specifically, Mageau and Vallerand (2003) utilized tenets of self-determination theory (Deci & Ryan, 2000) to explain how coaches influence athletes' motivation, which is a complex psychological construct that can be described as "an internal state or process that energizes, directs and maintains goal-directed behavior" (Cashmore, 2008, p. 287). Researchers and practitioners alike are often only concerned with the quantity of motivation and may believe that more motivation is simply better. In contrast, Deci and Ryan (2000) argue it is also and perhaps primarily the quality of motivation that influences individuals' thoughts, feelings, and behaviors. Hence, self-determination theory offers insight into the ways in which categorically different types of motivation can influence cognitive, affective, and behavioral outcomes (Teixeira, Carraca, Markland, Silva, & Ryan, 2012). For example, nurturing higher qualities of motivation within individuals has been found to positively affect their effort, persistence when faced with adversity, performance, performance-related anxiety, and well-being (Gillet, Berjot, & Gobance, 2009; Mack et al., 2011; Podlog & Dionigi, 2010; Ryan & Deci, 2002; Vallerand, 1997; Vallerand & Losier, 1999).

**Behavioral regulation.** Deci and Ryan (2000) suggest that individuals are more likely to experience such positive outcomes when they are self-determined in their motivation and they participate in behaviors with a sense of volition. This happens when individuals identify with the value of a certain behavior and the positive effect it can have on other aspects of their life (i.e., identified regulation) or they begin to fully accept the behavior's worth and recognize it as part



of their personal values and identity (i.e., integrated regulation). People experience the highest quality motivation when they engage in a behavior primarily for the pure enjoyment of learning, accomplishing tasks, and experiencing sensations in the process (i.e., intrinsic motivation). These optimal forms of behavioral regulation are considered to be self-determined in that behaviors are driven from factors completely within the person. In contrast, individuals are less likely to experience positive cognitive, affective, and behavioral outcomes when they engage in behaviors solely for tangible rewards or to avoid negative consequences (i.e., external regulation) and when they aim to feel positive or prevent negative emotions (i.e., introjected regulation). Such regulations are characterized as non-self-determined behaviors, meaning the motivation depends on sources completely or partially external to the individual (Deci & Ryan, 2000). Thus, in order to foster positive coach-athlete relationships, which produce optimal development and performance success for both agents within the interdependent dyad, it is valuable for coaches to nurture self-determined motivation within the athletes they work with.

**Basic psychological need satisfaction.** Promoting self-determined motivation can be accomplished by cultivating high perceptions and satisfaction of athletes' inherent basic psychological needs of competence (the need to interact effectively with the environment), autonomy (the need to be the director of one's actions that are in accordance with one's values), and relatedness (the need to be a valued and accepted member of a group; Deci & Ryan, 2000). Competent athletes have a sense of confidence in their ability to perform at a level that is demanded in a given situation (e.g., a particular drill or practice) and context (e.g., on their team or competitive level). Furthermore, athletes who are autonomous have a certain amount of choice in decisions rather than being dictated solely by others (e.g., coaches). They also perceive behaviors to align with their own values. Finally, athletes feel related when they are accepted and

valued as a member of the group, are connected and close to the people they interact with, and experience comfort in their respective role (Deci & Ryan, 2000).

**Coaching behaviors.** Mageau and Vallerand (2003) suggested that coaches can foster athletes' basic psychological need satisfaction through autonomy-supportive behaviors, structure, and involvement. Being autonomy supportive entails coaches taking "the other's [athlete's] perspective, acknowledges the other's feelings, and provides the other with pertinent information and opportunities for choice, while minimizing the use of pressures and demands" (Black & Deci, 2000, p. 742). However, it is important to note that an autonomy-supportive interpersonal style is different from a laissez-faire approach and does not infer offering complete independence to the learner (Mageau & Vallerand, 2003). Consequently, these autonomy-supportive behaviors are most beneficial when coaches also provide optimal structure (Curran, Hill, & Niemic, 2013), which offers clear directions, valuable information about expectations, and strategies that optimally support athletes' development and guide them towards the achievement of their objectives. Such feedback is necessary for athletes to achieve desired results and thus feel confident in their ability. This structure is not to be confused with control, which is characterized by demands, insistences, sanctions, and inflexible rules (Jang, Reeve, & Deci, 2010). Rather, optimal structure is aimed at avoiding the chaos that would occur when coaches are confusing or contradictory and fail to provide athletes with the means necessary to meet their expectations (Jang et al., 2010). Without their coaches' guidance, athletes often lack the knowledge and experience to improve and perform at the highest possible level (Mageau & Vallerand, 2003).

In addition, researchers have suggested that coaches are often viewed as mentors and even parental figures (Gould, Dieffenbach, & Moffett, 2002; Jowett & Cockerill, 2003). Their support and involvement in athletes' well-being plays an important role in the development of

their enjoyment (Ommundsen & Vaglum, 1991), motivation (Pelletier et al., 1995), and their ability to feel connected (Mageau & Vallerand, 2003, p. 893) in their sport environment. Due to these findings, it is important for coaches not only focus their efforts on developing the athlete as a competitor, but also as a person (Jowett & Cockerill, 2002). In general, it is difficult for athletes to trust coaches who do not show an interest in them on a personal level or can have a conversation about something non-sport related (Beenie & O'Connor, 2012). Thus, involvement is characterized by a close, caring, and supportive relationship and has been derived from the concept of social support.

### **Coach Education and Behavior Change**

Despite the various benefits of providing autonomy support, structure, and involvement there are still many coaches who do not utilize these behaviors adequately or effectively (Mageau & Vallerand, 2003). Therefore, it appears valuable for researchers, sport psychology professionals, and coach educators to help coaches understand the impact of and potentially improve their interactions and relationships with athletes through the use of these behaviors. Recently, there has been a substantial growth in the provision of and importance attached to coach education in many Western countries (Gilbert & Trudel, 1999a). There is undeniable worth to such programs in an effort to improve coaching (Woodman, 1993) and coaches also appear to be interested in coaching education (Gould, Giannini, Krane, & Hodge, 1990), especially when they perceive the material to be relevant (Vargas-Tonsing, 2007). According to behavior change theorists, in order to modify coaches' behaviors through educational programs or interventions it is essential to first understand, and possibly change, their perceptions toward the behavior of interest (Fishbein & Ajzen, 2010; Prochaska, & DiClemente, 1983).

**The reasoned action approach.** The reasoned action approach (Fishbein & Ajzen, 2010) offers a framework to understand the antecedents for such behavioral modifications (see Figure 4). It is based on the assumption that behavioral intention, which is “the person’s estimate of likelihood or perceived probability of performing a given behavior” (Fishbein & Ajzen, 2010, p. 39) determines behavior. In turn, intentions are influenced by attitudes, perceived behavioral control, and perceived norm (Fishbein & Ajzen, 2010). Attitude is considered to be individuals’ evaluation or appraisal of a behavior. Perceived behavioral control is people’s belief in their ability to perform a behavior and overcome possible barriers or obstacles. Perceived norm is the perceived pressure from others to engage in the behavior (Fishbein & Ajzen, 2010). Overall, individuals’ readiness to perform a behavior is enhanced by positive attitude, perceived behavioral control, and perceived norm. Thus, coaches’ attitude, perceived behavioral control, and perceived norm can provide insight into their intentions to ultimately engage in the behaviors of interest. Intentions are behavioral antecedents as they ultimately influence actual actions (e.g., Armitage & Conner, 2001; Godin & Kok, 1996; Hagger, Chatzisarantis, & Biddle, 2002).

Being able to measure coaches’ perceptions about autonomy support, structure, and involvement can offer foundational knowledge that allows researchers, sport psychology professionals, and coach educators to develop programs and interventions aimed at nurturing autonomy-supportive coaching styles. For example, if coaches hold negative perceptions of autonomy support, educational programs and interventions may focus more on subtle changes (i.e., attitude and cognition about autonomy support) rather than more obvious ones (i.e., behaviors). In contrast, if coaches already have high perceptions of autonomy support, educational programs and interventions may instead target specific and practical strategies coaches might utilize to engage in these behaviors during practice and competition. Thus, by

being aware of behavioral antecedents (i.e., attitude, perceived behavioral control, and perceived norm), researchers, sport psychology professionals, and coach educators can utilize the knowledge to develop an approach to educational programs and interventions that is explicitly tailored toward the needs of their audience. In addition to adapting the content and general approach of coach education efforts, assessing reasoned action approach variables (i.e., attitudes, perceived behavioral control, and perceived norm; Fishbein & Ajzen, 2010) can help to assess the immediate effectiveness of educational programs and interventions. This is especially helpful given that directly measuring changes in behavior is typically not possible immediately following educational programs and interventions, as coaches have not yet interacted with their athletes. However, behavioral antecedents (i.e., attitude, perceived behavioral control, and perceived norm) can be measured pre- and post-intervention to indicate potential changes in coaches' future behavior.

### **Purpose**

Gaining knowledge about attitude, perceived behavioral control, and perceived norm requires measurement. However, there is currently no instrument assessing coaches' attitude, perceived behavioral control, and perceived norm toward autonomy support, structure, and involvement. Consequently, the purpose of the current study was to develop a survey instrument to measure National Collegiate Athletic Association (NCAA) Division I and II coaches' attitude, perceived behavioral control, and perceived norm toward autonomy-supportive behaviors, structure, and involvement when working with student-athletes in practice. The practice environment has been chosen for the current study as basic psychological need satisfaction is context-specific (Vallerand, 1997) and practice represents the setting in which coaches spend the most time interacting with athletes. Due to the lack of an existing instrument to assess the

constructs of interest, the development of a valid and reliable scale can fill a gap within the literature and furthermore help researchers, sport psychology professionals, and coach educators tailor and evaluate educational programs and interventions for coaches.

### **Research Questions**

The current study was designed to answer the following research questions:

1. Does the developed instrument offer a valid and reliable instrument to measure NCAA Division I and II coaches' attitude, perceived behavioral control, and perceived norm toward autonomy-supportive behaviors, structure, and involvement in practice?
2. What are NCAA Division I and II coaches' attitude, perceived behavioral control, and perceived norm toward autonomy-supportive behaviors, structure, and involvement in practice?
3. Do NCAA Division I and II coaches' attitude, perceived behavioral control, and perceived norm toward autonomy-supportive behaviors, structure, and involvement in practice predict their perceived frequency to engage in the behaviors?
4. Are there differences between NCAA Division I and II coaches' attitude, perceived behavioral control, and perceived norm toward autonomy-supportive behaviors, structure, and involvement in practice?
5. Is there a difference in NCAA Division I and II coaches' attitude, perceived behavioral control, and perceived norm toward autonomy-supportive behaviors, structure, and involvement in practice based on demographic variables (e.g., gender, sport, head or assistant coach, years of coaching experience)?

## Methods

### Participants

A total of 497 NCAA head coaches participated in the current study, including 259 from Division I (52.1%) and 238 from Division II (47.9%). 174 of those individuals were female (35%) and 323 were male (65%). Participants self-identified as White/Caucasian ( $n = 436$ ; 87.7%), African-American ( $n = 23$ ; 4.6%), Hispanic/Latino ( $n = 11$ ; 2.2%), Asian/Pacific Islander ( $n = 2$ ; .4%), Native American/Eskimo/Aleut ( $n = 3$ ; .6%), and Other ( $n = 14$ ; 2.8%). Eight coaches preferred not to self-identify in regards to their race (1.6%). Participants were between 23 and 78 years old ( $M = 45.2$ ;  $SD = 11.53$ ) and had an average of 20.39 years of total experience ( $SD = 10.67$ ), 16.12 years of experience coaching at the collegiate level ( $SD = 9.69$ ), and 8.87 years of experience in their current job ( $SD = 8.8$ ). Participants coached in a variety of sports, which included Baseball ( $n = 38$ ; 7.6%), Basketball ( $n = 43$ ; 8.7%), Bowling ( $n = 1$ ; .2%), Cheerleading ( $n = 2$ ; .4%), Cross Country/Track and Field ( $n = 47$ ; 9.5%), Cycling ( $n = 1$ ; .2%), Dance ( $n = 2$ ; .4%), Equestrian ( $n = 1$ ; .2%), Field Hockey ( $n = 5$ ; 1%), Football ( $n = 5$ ; 1%), Golf ( $n = 68$ ; 13.7%), Gymnastics ( $n = 8$ ; 1.6%), Hockey ( $n = 4$ ; .8%), Lacrosse ( $n = 18$ ; 3.6%), Rifle ( $n = 4$ ; .8%), Rowing ( $n = 9$ ; 1.8%), Soccer ( $n = 58$ ; 11.7%), Softball ( $n = 48$ ; 9.7%), Swimming ( $n = 19$ ; 3.8%), Tennis ( $n = 40$ ; 8%), Volleyball ( $n = 67$ ; 13.5%), Water Polo ( $n = 1$ ; .2%), and Wrestling ( $n = 8$ ; 1.6%). In those sports 284 individuals primarily coached female athletes (57.1%), 124 primarily coached male athletes (24.9%), and 88 primarily coached both female and male athletes (17.7%). Currently head coaches were working with an average of 24.67 athletes ( $SD = 19.2$ ). The majority of participants had received a university degree ( $n = 491$ ; 98.8%), which included a Bachelor's degree ( $n = 205$ ; 41.2%), Master's degree ( $n = 268$ ;

53.9%), and Doctoral degree ( $n = 18$ ; 3.6%). Finally, 323 head coaches indicated that they had received formal training in coaching (65%).

## **Procedures**

Following approval by the university's Institutional Review Board, contact information for head coaches of all NCAA Division I and II athletic teams across all sports in the United States of America was gathered. The information was collected from their respective athletic programs' website, where email addresses are available to the public on the staff directory. Subsequently, all head coaches (i.e., 4465 from NCAA Division I and 3296 from NCAA Division II) with publicly available email addresses were contacted by the primary investigator via email (see Appendix A). The email described the purpose of the study, invited them to participate, and provided the online link for the survey. Coaches were also informed that their participation was voluntary and anonymous. Thus, recruitment for head coaches was purposeful and utilized a simple random sample giving every individual in the population (i.e., every NCAA Division I and II head coach) the equal probability to join the research. In addition, assistant coaches were recruited via the snowball method in that head coaches were asked to forward the link for the online survey to all assistant coaches on their staff. This was done to give head coaches the ability to decide if they wanted their staff members to participate in the study. Hence, all current NCAA Division I and II head and assistant coaches who are at least 18 years of age were recruited as participants. There were no other inclusion criteria.

Coaches who accessed the survey link were again provided with the purpose of the study, invited to participate, and informed that their participation was voluntary and anonymous. They were also informed that by completing the survey they indicated their consent to participate in the research. A second email (see Appendix B) was sent to all NCAA Division I and II head



coaches approximately one week later reminding them to participate and to forward the survey link to their assistant coaches in an effort to increase participation. Lastly, a third email (see Appendix C) was sent to all NCAA Division I and II head coaches approximately one week after the follow-up to again remind them to participate and forward the survey link to their assistant coaching staff to further increase participation.

A total of 612 NCAA Division I and II coaches participated in the online survey. To decrease potential response bias responses from coaches who indicated the same numbers on all Likert-type items ( $n = 34$ ) were eliminated. In addition, only 59 assistant coaches participated in the research. Furthermore, 22 individuals indicated that they held a different coaching role. Those 81 surveys were not used in the analyses as this subsample was deemed too small to sufficiently examine the extent to which the new instrument is valid and reliable for assistant coaches. In all, data from 497 of the original 612 surveys were analyzed.

### **Instrumentation**

The online survey (see Appendix D) consisted of: (a) a set of belief items, (b) a set of behavior items, (c) a set of demographic items, and (d) an optional open-ended item. The set of belief items measured NCAA Division I and II coaches' attitude, perceived behavioral control, and perceived norm towards autonomy-supportive, structure, and involvement in practice. Participants were asked to indicate their agreement with each statement on a Likert-type scale from 1 (*completely disagree*) to 7 (*completely agree*). The set of behavior items asked participants to indicate their perceived frequency of use of autonomy-supportive behaviors, structure, and involvement when interacting with athletes during practice on a Likert-type scale from 1 (*never*) to 7 (*always*). Demographic items instructed participants to identify their gender, age, race, competitive level, coaching role (i.e., head coach or assistant coach), sport they coach,

gender of athletes they coach, number of athletes they coach, years of coaching experience (i.e., at any level, the collegiate level, and in the current job), highest level of academic achievement, and formal training in coaching. The optional open-ended item provided participants with the opportunity to offer any additional comments they may have regarding coaches' interactions with athletes during practice to enhance their motivation.

### **Item Generation**

Items for the newly developed instrument were generated in three phases. This process was guided by the recommendations of DeVellis (2012). First, an initial item pool was developed based on an in-depth review of the literature regarding self-determination theory (Deci & Ryan, 2000), the coach-athlete relationship (Mageau & Vallerand, 2003), and the reasoned action approach (Fishbein & Ajzen, 2010; see Extended Review of the Literature). In addition, while no items were directly copied, existing scales regarding autonomy-supportive behaviors, structure, and involvement were reviewed (e.g., Motivators' Orientations Questionnaire; Deci, Schwartz, Sheinman, & Ryan, 1981; Perceived Motivational Climate in Sport Questionnaire; Walling, Duda, & Chi, 1993; Teachers as a Social Context Questionnaire; Belmont, Skinner, Wellborn, & Connell, 1988). This provided examples for similar indicators of the latent variables of interest. Second, the initial list of items was sent to nine individuals with knowledge and previous research experience in self-determination theory (Deci & Ryan, 2000), the coach-athlete relationship (Mageau & Vallerand, 2003), the reasoned action approach (Fishbein & Ajzen, 2010), or scale development. These individuals included three PhD and faculty members in Sport and Exercise Psychology, two PhD and faculty members in Statistics and Measurement, one JD and faculty member in Sport Management, two doctoral students in Sport and Exercise Psychology, and one master's student in Sport and Exercise Psychology for further review and

feedback. Third, once their feedback had been incorporated the items were sent to three coaches (i.e., one NCAA Division I assistant coach and two NCAA Division II assistant coaches) from a sample of convenience. These individuals coached at the appropriate competitive level (i.e., NCAA Division I and II), and, therefore, provided a valuable practical perspective. Furthermore, since these experts were from the population of interest, they were able to offer additional feedback about the clarity of the survey and indicate whether the scale is suitable for the given population. Data from these three assistant coaches were not analyzed as part of this study. Once these coaches' suggestions had been incorporated, an initial survey including 40 total items was created (i.e., ten for attitude, ten for perceived behavioral control, and 20 for perceived norm; see Appendix E).

### **Data Analysis**

In order to address the first research question of the study, an Exploratory Factor Analysis (EFA) was conducted to examine the hypothetical structure of the items. EFA was used because this was a novel scale with newly developed items. This further helped to eliminate redundant items and identify underlying factors. Descriptive statistics were used to address the second research question and indicate NCAA Division I and II coaches' attitude, perceived behavioral control, and perceived norm toward autonomy-supportive behaviors, structure, and involvement in practice. To address the third research question correlation and regression analyses were utilized to assess whether NCAA Division I coaches' attitude, perceived behavioral control, and perceived norm toward autonomy-supportive behaviors, structure, and involvement in practice predict their perceived frequency to engage in the behaviors. Lastly, to address the fourth and fifth research question multiple ordinal logistic regression analyses were conducted to investigate potential differences between NCAA Division I and II coaches' attitude,

perceived behavioral control, and perceived norm toward autonomy-supportive behaviors, structure, and involvement in practice as well as potential differences in their beliefs based on demographic variables. The qualitative data from the survey was not analyzed as part of the current research.

## **Results**

A total of 513 NCAA Division I and II head coaches participated in the current study, which represented a total response rate of 7% (4465 NCAA Division I head coaches and 3296 NCAA Division II were contacted). This low response rate was not surprising given the time constraints of individuals within the population. In addition, while frequently used online surveys have been shown to have low response rates (Colton & Covert, 2007; Fowler, 2014). However, due to the low response rate, any results from the current research are primarily exploratory and potentially not generalizable. Yet, the present findings begin to provide an understanding for the phenomena of interest and potentially highlight areas that would be worthy to explore in future research.

### **Development of the Coach Autonomy Support Beliefs Scale**

EFA was found to be an appropriate method to develop the instrument as it used novel items that had not previously been tested for their validity and reliability. The statistical package MPlus Version 7.2 was used for the current research. The MPlus estimation (i.e., WLSMV) and rotation (i.e., Geomin) methods were most appropriate for an item-level EFA when items are measured on an ordinal scale. Four criteria were implemented to determine the factors and their related items: (a) examination of Scree plot, (b) retaining only items with standardized factor loadings  $\geq .50$ , (c) deleting items with cross-loadings (difference  $\leq .20$ ), and (d) retaining only items that were conceptually related to the factor with the highest factor loading.

After an initial examination of the Scree plot and factor loadings for one through nine factor EFAs no adequate solution was found that satisfied all four criteria. Frequency distributions indicated that this was likely due to the negatively skewed distribution of the data. An average of only 23.16% of all participants responded with numbers below six across all items on the 7-point Likert-type scale. Therefore, due to extremely low sample sizes for responses below 6, all items were re-coded (i.e., responses  $\leq 6$  were coded as 0 and responses = 7 were coded as 1). However, one through nine factor EFAs for the dichotomous variables again did not provide an adequate solution that satisfied all four criteria. In those analyses, it became apparent that it was primarily items related to structure and involvement that had either multiple factor loadings or were not conceptually related to the factor with the highest factor loadings. Therefore, it was deemed necessary to exclude those items and continue with only items assessing NCAA Division I and II head coaches' attitude, perceived behavioral control, and perceived norm toward autonomy-supportive behaviors. Thus, 16 items related to the constructs of structure and involvement were deleted at this stage of the analysis.

Examination of the 9-factor Scree plot for the remaining 24 dichotomous items indicated a two factor solution. The two-factor solution was confirmed through multiple EFAs in which items that did not meet the above mentioned criteria were eliminated. This final solution included eight of the initially 24 analyzed items. Factor 1 was comprised of items related to attitude and perceived norm. Therefore, it represented NCAA Division I and II head coaches' personal belief about their use of autonomy-supportive behavior. Factor 2 incorporated items related to perceived norm. Hence, it entailed NCAA Division I and II head coaches' social influence to use autonomy-supportive behavior. Five items had statistically significant loadings on factor 1 (i.e., personal belief;  $p = .05$ ) and three items had statistically significant loadings on

factor 2 (i.e., social influence;  $p = .05$ ; see Table 3). The final two-factor solution demonstrated adequate model fit ( $\chi^2 = 35.86$ ,  $p = 0.01$ ;  $RMSEA = .042$ , 99%  $CI$  [.020; .063],  $p = .703$ ;  $CFI = .991$ ;  $TLI = .983$ ). Reliability estimates for the entire sample revealed acceptable levels for participants' ratings of their personal beliefs (5 items, Cronbach's  $\alpha = .77$ ) and social influence (3 items, Cronbach's  $\alpha = .77$ ). Thus, the Coach Autonomy Support Beliefs Scale (CASBS) is an eight items measure with two subscales: personal belief (five items) and social influence (three items).

### **NCAA Division I and II Head Coaches Beliefs toward Autonomy Support**

Overall, NCAA Division I and II head coaches reported positive personal belief and social influence toward autonomy-supportive behaviors in practice. For the five personal belief items on the CASBS 23.3-41.4% of all coaches indicated complete agreement. When asked about their perceptions of the behavior of other coaches they respect (i.e., social influence) 22.5-26% of all participants indicated complete agreement.

### **Influence of Coaches' Beliefs on their Autonomy Supportive Behavior**

Fishbein and Ajzen (2010) suggest that individuals' attitude, perceived behavioral control, and perceived norm toward a behavior will influence their actual behavior. Thus, the six behavior items related to autonomy support that were assessed as part of the current research were used to further validate the new instrument. MPlus 7.2 was used for a three-factor Confirmatory Factor Analysis (CFA) in which the two factors from the CASBS (i.e., personal belief and social influence) and a factor comprising the six behavior items were entered (i.e., behavior; see Figure 6). The CFA revealed acceptable factor loadings for all behavior items ( $p = .05$ ). Bivariate correlations demonstrated significant positive relationships between all three factors: personal belief and social influence ( $r = .80$ ,  $p < .05$ ), personal belief and behavior ( $r =$

.70,  $p < .05$ ), and social influence and behavior ( $r = .66$ ,  $p < .05$ ). Reliability estimates for the entire sample revealed acceptable levels for participants' ratings of behavior (6 items, Cronbach's  $\alpha = .75$ )

Additionally, regression analyses revealed factor 1 to be a statistically significant predictor for behavior [ $F(1, 496) = 172.74$ ,  $p < .001$ ] that accounted for 25.9% of the total variance in participants' use of autonomy-supportive behaviors. Similarly, regression analyses revealed factor 2 to be a statistically significant predictor for behavior [ $F(1, 496) = 126.46$ ,  $p < .001$ ] that accounted for 20.3% of the total variance in participants' use of autonomy-supportive behaviors. Thus, the more positive NCAA Division I and II head coaches' personal belief and social influence, the higher they perceived their frequency of using autonomy-supportive behaviors.

### **Differences in Coaches' Beliefs based on Demographics**

Ordinal logistic regression models were used to assess potential differences between NCAA Division I and II head coaches' beliefs regarding autonomy support. This analysis was chosen due to the ordinal nature of the dependent variables (i.e., both factor 1 and 2 had a potential range of values from 0 to 1). In each ordinal logistic regression model one demographic variable (i.e., gender, age, race, competitive level, gender of athletes they coach, number of athletes they coach, coaching experience, highest level of academic achievement, and formal training in coaching) was entered as the predictor variable. The criterion variables for the separate ordinal logistic regressions were factor 1 (i.e., personal belief) and factor 2 (i.e., social influence).

**Factor 1.** The ordinal logistic regressions (see Table 2) revealed no significant differences in NCAA Division I and II head coaches' personal belief toward autonomy-supportive behaviors based on gender ( $\chi^2 = .172$ ,  $p = .679$ ), age ( $\chi^2 = 36.08$ ,  $p = .964$ ), race ( $\chi^2 = .313$ ,  $p = .576$ ),

competitive level ( $\chi^2 = .820, p = .365$ ), gender of athletes they coach ( $\chi^2 = .196, p = .906$ ), number of athletes they coach ( $\chi^2 = 74.56, p = .195$ ), total coaching experience ( $\chi^2 = 42.40, p = .736$ ), coaching experience in college ( $\chi^2 = .46.71, p = .566$ ), highest level of academic achievement ( $\chi^2 = 1.11, p = .293$ ), and formal training in coaching ( $\chi^2 = .317, p = .574$ ). Coaches' years of experience in their current job ( $\chi^2 = .64.47, p = .024$ ) was the only significant positive predictor of their personal belief toward autonomy-supportive behaviors. This finding indicated that coaches with more years of experience in their current job had a more positive personal belief toward autonomy-supportive behaviors.

**Factor 2.** The ordinal logistic regressions (see Table 2) revealed no significant differences in NCAA Division I and II head coaches' social influence toward autonomy-supportive behaviors based on gender ( $\chi^2 = 1.45, p = .229$ ), age ( $\chi^2 = 43.73, p = .810$ ), race ( $\chi^2 = .926, p = .336$ ), competitive level ( $\chi^2 = .398, p = .528$ ), gender of athletes they coach ( $\chi^2 = .485, p = .785$ ), number of athletes they coach ( $\chi^2 = 82.28, p = .073$ ), total coaching experience ( $\chi^2 = 58.60, p = .164$ ), highest level of academic achievement ( $\chi^2 = .297, p = .581$ ), and formal training in coaching ( $\chi^2 = .1.21, p = .271$ ). Number of years coaching in college ( $\chi^2 = 85.38, p = .001$ ) and in their current job ( $\chi^2 = 68.5, p = .010$ ) were the only significant positive predictors of their social influence toward autonomy-supportive behaviors. This finding highlighted that coaches with more years of experience coaching at the collegiate level and in their current job had a more positive social influence toward autonomy-supportive behaviors.

## Discussion

The CASBS offers valid and reliable measurements for NCAA Division I and II head coaches' personal belief and social influence toward autonomy-supportive behaviors when working with student-athletes in practice. The final two-factor solution for the CASBS (see



Appendix H) revealed adequate model fit for a scale comprising eight total items (i.e., five items for personal belief and three items for social influence). The CFA provided support for convergent and discriminant validity. The following discussion will be dedicated to a more in-depth critique and exploration of the current findings. Furthermore, the influence of demographic variables (or the lack thereof) on participants' beliefs toward autonomy-supportive behaviors will also be discussed.

### **Critique of the CASBS**

While the EFA procedures resulted in an instrument that provides valid and reliable measurements, there are several issues that became apparent during the analysis that are worthy to discuss.

**Elimination of structure and involvement.** The initial purpose of the current research was to develop an instrument measuring NCAA Division I and II coaches' beliefs toward autonomy-supportive behaviors, structure, and involvement. Yet, all items related to structure and involvement were eliminated during the process of achieving an adequate model fit. Mageau and Vallerand (2003) suggested that in addition to autonomy support, structure and involvement also have a meaningful influence on athletes' basic psychological need satisfaction. Curran and colleagues (2013) supported this by arguing that the provision of structure is one of the most important tasks of any socializer (e.g., coach) as it offers clear directions, valuable information about expectations, and explains the behaviors that are necessary to achieve certain performance outcomes. However, most researchers have explored structure as it pertains to the education domain (e.g., Jang et al., 2010; Sierens, Vansteenkiste, Goossens, Soenens, & Dochy, 2009; Vansteenkiste et al., 2012) creating a gap of empirical evidence in the athletic context. As an exception, Curran and colleagues (2013) assessed the influence of structure instilled by coaches

on 281 youth soccer players' basic psychological need satisfaction. They measured structure using a modified version of the Teacher as a Social Context Questionnaire (TASC; Belmont, Skinner, Wellborn, & Connell, 1988), which has been found to be valid and reliable in the physical education setting (Taylor & Ntoumanis, 2007). Yet, to the author's knowledge there is currently no valid and reliable measure that has been developed for the sport environment. While not developed for the sport context, the TASC (Belmont et al., 1988) provides a plausible starting point to further explore what behaviors represent structure instilled by coaches. Belmont and colleagues (1988) suggested that an education structure is characterized by contingency (e.g., When I discipline this student, I always explain why), expectations (e.g., I try to be clear with this student about what I expect of him/her in class), monitoring/adjustment (e.g., I can't tell when this student is keeping up with me), and help/support (e.g., I show this student different ways to solve problems). The current research only included items related to expectations and help support. Thus, it is possible that the structure items in the current research were developed based on an incomplete representation of the construct of interest (i.e., structure). It is therefore possible that the items related to structure were not reflective of this construct and the behaviors that are provided by coaches when interacting with athletes in practice.

Involvement is characterized by a close, caring, and supportive relationship and appears to be related to the more extensively explored concept of social support. When measuring involvement in the athletic context, previous researchers have used surveys that measure social support. For example, Reynolds and McDonough utilized the social support subscale of the Quality of Relationships Inventory (Pierce, 1994; Pierce, Sarason, & Sarason, 1991) to assess involvement and found that involvement moderated the relationship between autonomy support and basic psychological need satisfaction. In other words, autonomy support was more effective

in predicting need fulfillment and motivation when athletes reported that they were supported by a caring coach-athlete relationship (i.e., involvement).

Social support has been found to be a multidimensional construct consisting of emotional (i.e., listening, comforting, and challenging), informational (i.e., confirming, appreciating, and motivating), and tangible support (i.e., material and personal assistance; Bianco & Eklund, 2001). Thus, if the assumption that involvement mirrors social support is accurate, then it should be questioned if the construct was represented comprehensively in the current research. That is, the items used in the current study seemed to primarily represent emotional support (e.g., Showing genuine interest in athletes' well-being beyond sport). Furthermore, Belmont et al. (1988) denoted involvement in four dimensions on the TASC: affection (e.g., This student is easy to like), attunement (e.g., I know this student well), dedication of resources (e.g., I spend time with this student), and dependability (e.g., This student can count on me to be there for him/her). The items related to involvement that were used in the current research did not seem to adequately represent the multidimensional nature of the construct of interest (i.e., involvement) and did not characterize the variety of ways coaches can demonstrate involvement in practice. Consequently, the current findings call for researchers to re-examine the construct of involvement as multidimensional.

In sum, the current findings suggest that the items related to structure and involvement might not have adequately represented the latent variables (i.e., structure and involvement). Additionally, structure and involvement as a whole were likely underrepresented as only eight items total were included for each construct in comparison to 24 total items for autonomy-supportive behaviors. DeVellis (2012) suggested that, "By using multiple and seemingly redundant items, the content that is common to the items will summate across items while their

irrelevant idiosyncrasies will cancel out” (p. 78). According to Lord and Novick (2008), this is due to signal increasing exponentially as items are added (i.e., increasing the variance that is of substantive interest and represents actual change; see DeVellis, 2012). Therefore, it is possible to enhance an instrument’s reliability by developing more items (DeVellis, 2012).

Mageau and Vallerand (2003) began to challenge researchers to operationalize autonomy support as more than simply providing choice and proposed seven specific autonomy-supportive behaviors. Based on the current findings, future research seems justified to further explore the exact nature of structure and involvement. By finding more concrete behaviors that coaches can use to demonstrate structure and involvement when working with athletes in practice, it is likely possible to develop items that more adequately represent those constructs. Instruments from the educational domain (e.g., TASQ; Belmont et al., 1988; social support subscale of the Quality of Relationships Inventory; Pierce, 1994; Pierce et al., 1991) provide a plausible starting point for such research. In addition, qualitative research could offer valuable information to understand structure and involvement through the perspective of those in the field (i.e., coaches and athletes). Such a more in-depth understanding can potentially help to construct an instrument that accurately measures NCAA Division I and II head coaches’ beliefs about structure and involvement, which should be developed as additional scales in future research.

**Skewed distribution of data.** Participants in the present research reported an overall positive personal belief and social influence toward autonomy support; the distribution of responses was found to be negatively skewed. Specifically, NCAA Division I and II head coaches appeared to hold a strong belief that autonomy-supportive behaviors can enhance athletes’ motivation and coaches also felt like they were able to implement such behaviors in practice (i.e., personal belief). Additionally, participants reported that coaches they respect tend

to utilize autonomy support in practice (i.e., social influence). However, it seems justified to at least cautiously question whether these almost exclusively positive responses accurately represent NCAA Division I and II head coaches' perceptions toward autonomy-supportive behaviors. In addition, the negatively skewed distribution of the data led to issues with model fit. There are several possible explanations for the current findings and participants' predominantly positive beliefs.

First, personal belief and social influence are part of individuals' self-concept and cannot be objectively observed. Instead, such constructs require people to engage in a reflexive process (i.e., individuals evaluate how they perceive their own characteristics; Butler & Gasson, 2005). Therefore, personal belief and social influence were measured using self-reports (i.e., a person's cognitive representation; Damon & Hart, 1998), which are not free of issues and personal biases. This can provide one possible reason for participants reporting such positive beliefs. When asked to judge their own characteristics, people tend to evaluate themselves as better than the average person (i.e., better-than-average effect; see Alicke, Klotz, Breitenbecher, Yurak, & Vredenburg, 1995). Hence, it is possible that the current data offered an inaccurate picture of the self-concept (i.e., personal belief and social influence; see Butler & Gasson, 2005) as NCAA Division I and II coaches might have consciously or unconsciously evaluated themselves as better than the average individual.

Second, in the current research only participants who coach at what can be considered an elite level (i.e., NCAA Division I and II) were recruited. It seems reasonable to suggest that being a head coach at the NCAA Division I and II level requires coaches to possess a certain amount of effectiveness. Coaching effectiveness has been defined as, "The consistent application of integrated professional, interpersonal, and intrapersonal knowledge to improve athletes'

competence, confidence, connection, and character in specific coaching contexts” (Cote & Gilbert, 2009, p. 316). According to Cote and Gilbert (2009), coaches with a specific knowledge base in particular contexts and a high level of effectiveness can be considered coaching experts. Furthermore, Wiman, Salmoni, and Hall (2011) suggested that coaching experts are individuals who have ten or more years of experience (Ericsson, Krampe & Tesch-Roemer, 1993), are recognized by other coaches and athletes as experts, and have successful athletes/teams at any level of competition. Participants in the current study likely possessed some, if not all, these characteristics (e.g., individuals had an average of 20.39 years of total experience). Consequently, it appears warranted to presume that many NCAA Division I and II head coaches might be considered coaching experts or at the very least perceive themselves to be coaching experts. If that is the case, NCAA Division I and II head coaches might have the knowledge to recognize autonomy support as beneficial in enhancing motivation and perceive to have the ability to incorporate autonomy-supportive behaviors in practice if they chose to do so (i.e., personal beliefs). Furthermore, given that NCAA Division I and II head coaches are surrounded by other coaches within the athletic department, and that many coaches attend conferences with colleagues at the same competitive level, it is likely that participants in the current study have been around other expert coaches who use those behaviors (i.e., social influence).

Third, while beyond the scope of the current research it seems justified to explore personal belief and social influence toward autonomy-supportive behaviors of coaches in other competitive levels (e.g., youth or high school) or other coaching roles (e.g., assistant coaches). These individuals might respond in a way that provides a more normal distribution of beliefs about autonomy support and enhance model fit. More importantly, such research would help to explore whether the overall positive personal belief and social influence in the current findings

can be generalized to the overall coaching profession (i.e., across competitive levels and roles). Hence, this can provide a more holistic understanding of the current state of coaches' beliefs about autonomy-supportive behaviors and further inform attempts to improve coaching practices through educational programs and interventions across competitive levels and roles. Similarly, it would be valuable to explore these beliefs among coaches of other races as the participants in the present study predominantly self-identified as White/Caucasian ( $n = 436$ ; 87.7%). However, it should be noted that the current sample provided an accurate representation of NCAA Division I and II head coaches (i.e., in 2012 86.2% of NCAA Division I and 88% of NCAA Division II head coaches were White/Caucasian; Lapchick, Agusta, Kinkopf, & McPhee, 2012).

Fourth, the majority of scale items used for the current research were positively worded (e.g., Acknowledging athletes feelings enhances their motivation), which might have motivated participants to respond positively (i.e., potential response bias). While four items were negatively worded item (e.g., Making athletes feel guilty diminishes their motivation), these were also worded in a way that did not need to be reversed scored. Negatively worded items could potentially diminish acquiescence, affirmation, or agreement bias (DeVellis, 2012) and therefore enhance the normality of the distribution and should be included in efforts to further develop the CASBS. However, it should be noted that researchers have also argued that these advantages generally do not outweigh the disadvantages as participants may be unnecessarily confused (e.g., DeVellis, 2012). Furthermore, the negatively skewed distribution of the current findings suggests that using a Likert-type scale from 1 (*completely disagree*) to 7 (*completely agree*) might not provide the best possible response format for an exploration of NCAA Division I and II head coaches' personal belief and social influence toward autonomy-supportive behaviors. Overall, participants had primarily positive perceptions about autonomy support. Therefore, since the

majority of individuals in the current research did not indicate low agreement with statements (e.g., completely disagree), there might have been recency effects (i.e., response choices such as completely agree which were presented late were most likely to be selected; e.g., Chan, 1991; Johnson, 1981). Therefore, it appears justified to explore whether listing positive choices (e.g., completely agree) first might decrease participants tendency to respond positively.

Furthermore, while 7-point Likert-type scales have been shown to give participants optimal flexibility to correctly rate the intensity of agreement (Colton & Covert, 2007), it might be beneficial to explore coaches' beliefs toward autonomy-supportive behaviors using Likert-type scales with less response options (e.g., 5-point Likert-type scale). Furthermore, lower response options might have to be worded more positively (e.g., agree less instead of completely disagree) to gain a more in-depth understanding of the nuanced differences in coaches' personal belief and social influence. In sum, while recoding the personal belief and social influence variables helped in finding an adequate model fit, further refinement of the CASBS seems warranted. Future researchers should also explore whether the current results are an accurate representation of NCAA Division I and II coaches' perceptions about autonomy support.

### **Further Development of the CASBS**

An adequate model fit for NCAA Division I and II coaches' personal belief and social influence toward autonomy-supportive behaviors was found in the current research. Yet, 16 of the initial 24 autonomy support items entered into the EFA were not retained in the final two-factor solution. Thus, in an attempt to further strengthen and refine the CASBS, it appears warranted to re-examine all items that were deleted as part of the EFA. The present findings indicate that the deleted items might have to be reworded to more adequately represent the constructs of interest. For example, all four items related to asking for athletes' input (see



Mageau & Vallerand, 2003) were eliminated, which proposes that this behavior might not have been represented sufficiently. Simultaneously, it also seems noteworthy that four out of eight items in the final two factor solution are specifically concerned with athletes' feelings. This supports Mageau and Vallerand's (2003) call for a more nuanced understanding of autonomy support as previous researchers have frequently operationalized autonomy support simply as providing choice (e.g., Zuckerman, Porac, Lathin, Smith, & Deci, 1978). The current findings seem to be in line with Mageau and Vallerand's (2003) notion that choice likely does not fully represent the complexity of autonomy support. Instead, they proposed seven specific autonomy-supportive behaviors, which also entail behaviors related to athletes' feelings - a meaningful influence on individuals' basic psychological need satisfaction (Deci, Eghrari, Patrick, & Leone, 1994; Koestner, Ryan, Bernieri, & Holt, 1984). Based on the current findings, acknowledging athletes' feelings and avoiding behaviors that make athletes feel guilty were found to be important indicators for the latent variables of interest (i.e., personal belief and social influence). However, while Mageau and Vallerand's (2003) proposed specific autonomy-supportive behaviors for the coach-athlete relationships these are primarily informed by research within the context of education and might not provide a comprehensive understanding of autonomy support in the athletic domain. Therefore, findings from the present study indicate that additional research is warranted to gain a more in-depth understanding of autonomy support in an attempt to fully explain all behaviors that encompass the construct within sport. Due to the explorative nature of such efforts it would be valuable to investigate autonomy support through qualitative research with both coaches and athletes. For example, researchers should explore how coaches and athletes, respectively, conceptualize autonomy support in the athletic context. Furthermore, it seems valuable to also assess potential barriers that may hinder coaches from engaging in

autonomy-supportive behaviors in practice. Understanding potential barriers to autonomy-supportive behaviors can allow researchers to then explore strategies that coaches have used to overcome these barriers.

Factor 2 (i.e., social influence) represents the social or environmental influence that NCAA Division I and II head coaches recognize about autonomy-supportive behaviors. Both the TRA (Ajzen & Fishbein, 1980) and the TPA (Ajzen, 1985) limited such perceived pressures to engage in a behavior to the awareness of what important others expected or wanted the person to do. However, in their revised reasoned action approach, Fishbein and Ajzen (2010) suggested that while such descriptive norms (i.e., expectations) have an important influence on individuals' intentions, they do not suffice in providing a more inclusive and comprehensive understanding of why people ultimately decide to behave a certain way. They, instead, argued that seeing others actually perform the behavior of interest themselves can also have a meaningful effect on people's intentions to do so as well (i.e., injunctive norms; Fishbein & Ajzen, 2010). Thus, findings from the current study offer support for Fishbein and Ajzen's (2010) revised theory on how social and environmental pressures influence an individuals' behavior. That is, all items related to descriptive norms were eliminated and only items associated with injunctive norms were retained in the present instrument. Therefore, the current findings suggested that injunctive norms were a more significant indicator of participants' social influence toward autonomy-supportive behaviors than descriptive norms. In the context of coaching this proposes that seeing important others perform a behavior may be a more meaningful social influence than the mere expectation that they should engage in the behavior.

In addition, it is noteworthy to highlight that all retained social influence items were constructed to specifically ask participants about the impact of coaches they respect. Initially,

both the TRA (Ajzen & Fishbein, 1980) and TPA (Ajzen, 1985) proposed that, “knowing what a referent prescribes may put little or no pressure on a person to carry out that behavior unless that person is motivated to comply with the referent in question” (Fishbein & Ajzen, 2010, p. 137).

Thus, whether the referent person was of value for the individual was also assumed to be an important influence on perceived norm. While researchers have found that this impulse actually adds little to nothing to the prediction of injunctive norms (e.g., Montano, Thompson, Taylor, & Mahloch, 1997; Sayeed, Fishbein, Hornik, Cappella, & Ahern, 2005) the current study revealed that the social influence of respected individuals had a meaningful influence on NCAA Division I and II beliefs toward autonomy-supportive behaviors in practice. Future researchers, however, may want to compare the social influence of respected coaches and of other coaches on beliefs toward autonomy-supportive behaviors.

### **Beliefs about Autonomy Support and Coaches’ Use of Autonomy-supportive behaviors**

Fishbein and Ajzen (2010) suggested that individuals’ attitude, perceived behavioral control, and perceived norm toward a behavior will influence their actual behavior. In the current research, attitude, perceived behavioral control, and perceived norm were represented within the two factors (i.e., personal belief and social influence). The current findings support Fishbein and Ajzen’s (2010) assumptions in that personal belief was found to be a statistically significant predictor for behavior and accounted for 25.9% of the total variance in participants’ use of autonomy-supportive behaviors. Similarly, social influence was revealed to be a statistically significant predictor for behavior and accounted for 20.3% of the total variance in participants’ use of autonomy-supportive behaviors. Thus, the more positive NCAA Division I and II head coaches’ personal belief and social influence, the higher they perceived their frequency of engaging in autonomy-supportive behaviors during practice. This is an indicator of construct

validity, which is “the extent to which a measure ‘behaves’ the way the construct it purports to measure should behave with regard to established measures of other constructs” (DeVellis, 2012, p. 64). Personal belief and social influence were supposed to predict behavior, an assumption that was supported by the correlation and regression analyses.

Therefore, the present results not only helped to validate the CASBS, but also have practical value for researchers, sport psychology professionals, and coach educators. Explicitly, being able to measure coaches’ personal belief and social influence toward autonomy-supportive behaviors can help to develop programs and interventions tailored at improving particularly weak beliefs (e.g., low personal belief toward autonomy-supportive behaviors). For example, if coaches hold a negative personal belief toward autonomy support, educational programs and interventions may focus more on subtle changes (i.e., attitude and cognition about autonomy support) rather than more obvious ones (i.e., behaviors). If coaches already have a positive personal belief toward autonomy, such as the current participants, it may be more beneficial to, instead, teach practical approaches coaches might use to engage in these behaviors during practice. In addition, measuring coaches’ personal belief and social influence can help to assess the immediate effectiveness of educational programs and interventions since it is not possible to directly gauge changes in behavior following educational programs and interventions as coaches have not yet interacted with their athletes. However, behavioral antecedents (i.e., personal belief and social influence) can be measured pre- and post-intervention to indicate potential changes in coaches’ future behavior. This was supported by the current findings in that personal belief and social influence were statistically significant predictors of NCAA Division I and II head coaches’ reported frequency of engaging in autonomy-supportive behaviors in practice. Lastly, additional research can be conducted to assess if the impact of an educational program and intervention on

coaches' personal belief and social influence can be maintained over time (e.g., over the course of a competitive season) and if these beliefs translate into the engagement of autonomy-supportive behaviors.

### **Demographic Variables and Coaches' Beliefs**

Mageau and Vallerand (2003) suggested that coaches' actual use of autonomy support is primarily influenced by their personal orientation, coaching context, and perceptions of athletes' behavior and motivation. The findings of the current study suggest that personal belief and social influence may act as a mediator between the use of autonomy support and coaches' personal orientation, coaching context, and perceptions of athletes' behavior and motivation (see Figure 5). Therefore, it would make sense to assess variables related to these behavioral antecedents (i.e., personal orientation, coaching context, and perceptions of athletes' behavior and motivation) when trying to understand coaches' beliefs about autonomy-supportive behaviors. The present results indicated that coaches' years of experience in their current job positively influenced their personal belief. Furthermore, coaches' experience in their current job and the number of years spent coaching at the collegiate level positively affected their social influence. These findings are consistent with Zakrajsek, Martin, and Zizzi (2011), who found coaching experience to be a significant predictor of high school football coaches' attitude toward sport psychology services. That is, more experienced coaches were more open to such services.

Based on previous research, it appears reasonable to categorize these demographic variables (i.e., coaching experience) as part of coaches' personal orientation or contextual factors. It is likely that coaches' experience has a meaningful influence on their coaching style (i.e., personal orientation) as it allows them to learn from previous interactions with athletes and over time identify how autonomy-supportive they want to be. In addition, previous researchers

have identified contextual factors such as opportunities for professional development, job security, and low work-life conflict to explore their influence on coaches' use of autonomy support (Stebbing, Taylor, Spray, & Ntoumanis, 2012). It seems warranted to suggest that factors such as professional development, job security, and low work-life conflict all may increase the number of years coaches spend in their current job and at the collegiate level.

Previous researchers have suggested that when authority figures are reminded of their responsibility to be successful, they typically use more directives, criticism, and controlling questions (i.e., controlling behaviors; Deci, Spiegel, Ryan, Koestner, & Kaufman, 1982). This might stem from the perceived pressure to compare and out-perform other coaches, the constant requirement for decision-making, and the expectations from administration and spectators not only about how to run the team but particularly to guide athletes to successful competitions (Rocchi, Pelletier, & Couture, 2013). The current finding suggest that coaches with more experience might not perceive these pressures as meaningful or have learned to have positive personal beliefs and social influence toward autonomy-supportive behaviors despite their existence.

Overall, the current research only included a limited number of variables that pertained to behavioral antecedents (i.e., coaches' personal orientation, coaching context, and perceptions of athletes' behavior and motivation). The competitive level (i.e., NCAA Division I or II), gender of athletes coached, and number of athletes coached represented part of participants coaching context and did not meaningfully influence coaches' personal belief and social influence. It is reasonable to suggest that both the NCAA Division I and Division II levels can be considered to be elite performance domains. This may explain why they represent similar contextual factors

and no significant differences in head coaches' personal belief and social influence were found based on this variable.

In sum, it appears warranted to explore other contextual factors that might meaningfully affect coaches' personal belief and social influence toward autonomy-supportive behaviors. For example, Rocchi and colleagues (2013) found that coaches' perceptions about athletes' motivation had an impact on autonomy support, but this relationship was mediated by their own motivation. Thus, the influence of coaches' own motivation on their personal belief and social influence toward autonomy-supportive behaviors should be explored in further research. In sum, future researchers should seek to gain a more comprehensive understanding of the variables that influence coaches' personal belief and social influence toward autonomy-supportive behaviors.

## **Conclusion**

The current research offers an instrument that provides valid and reliable measurements of NCAA Division I and II head coaches' personal belief and social influence toward autonomy-supportive behaviors. It is important to note that it would be valuable to further replicate and extend the current research due to the measurement issues described above. Nevertheless, the CASBS can likely help researchers, sport psychology professionals, and coach educators tailor and evaluate educational programs and interventions for coaches. While changes in behavior cannot be assessed immediately following educational programs and interventions as coaches have not yet interacted with their athletes, these behavioral antecedents (i.e., personal belief and social influence) can be used to indicate potential changes in coaches' future behavior. The current findings supported this assumption in that there was a statistically significant positive relationship between NCAA Division I and II head coaches' personal belief (i.e., factor 1), social influence (factor 2), and their self-reported frequency of use of autonomy support.

## **Section 2: Extended Review of the Literature**

### **The Coach-Athlete Relationship**

Various frameworks have been employed to conceptualize and consequently better understand the interpersonal dynamics between coaches and athletes. Among those, the Multidimensional Model of Leadership in Sport (Chelladurai, 1993) and the Mediational Model of the Coach-Player Relationship (Smoll, Smith, Curtis, & Hunt, 1978) are two approaches that have frequently been utilized to explore coaches' interpersonal behavior. Such research was conducted in an attempt to develop effective leadership and coaching which has been defined as, "the consistent application of integrated professional, interpersonal, and intrapersonal knowledge to improve athletes' competence, confidence, connection, and character in specific coaching contexts" (Cote & Gilbert, 2009, p. 316). However, according to many well-known coaches, "almost everything in leadership comes back to relationships" (Coach Mike Krzyzewski, Duke University head basketball coach, as cited in Janssen & Dale, 2002, p. 131). Coach Knute Rockne (former University of Notre Dame head football coach) shared this sentiment in stating, "the secret to coaching success can be reduced to a simple formula: strict discipline in your training program and on the field, combined with a high and continuing interest in all your other relationships with your kids [athletes]" (Brondfield, 1976, p. 83). Hence, in order to enhance interpersonal behaviors between coaches and athletes it appears beneficial to study the dynamics from a relationship perspective. This is particularly important as elite athletes often spend more than 150 days with their coaches every year (Froyen & Pensgaard, 2014).

Researchers have identified a multitude of factors that can influence the coach-athlete relationship; both positively and negatively. For example, Australian professional cricket and rugby players and coaches indicated that in order to nurture positive coach-athlete relationships



coaches need to adapt a focus on player development and education (Bennie & O'Connor, 2010; 2012). Consequently, the most effective relationships are cultivated when coaches employ an athlete centered approach and athletes perceive their coaches as teachers, mentors, and friends (Becker, 2009). This entails coaches who take a holistic approach to their profession by gaining an awareness of each athlete and demonstrating a genuine interest in elements of their lives beyond the sport context. Such a style requires open, constructive, and regular dialogue regardless of competitive outcomes, which coaches can nurture when they are not only accessible but also approachable (Becker, 2009). Subsequently, a comfortable environment is created allowing the relationship to develop. For example, being around the athletic facilities displays accessible but an open door policy further indicates a level of approachability and allows athletes to establish rapport and trust with their coaches (Bennie & O'Connor, 2010; 2012). It is further important that coaches treat all athletes in a fair, patient, and non-judgmental manner as this perceived justice further enhances trust and commitment in the relationship (Becker, 2009; Nikbin, Hyun, Iranmanesh, & Foroughi, 2014).

In addition, athletes are influenced by how competent they perceive their coaches to be. Specifically, they are more likely to respond, listen, and adhere to coaches if they believe in their ability to coach them effectively (Jackson, Knap, & Beauchamp, 2009). In this context, characteristics of an effective coach include a positive attitude and coaching style, an elite status (i.e., as a former athlete and/or as a current coach), good communication skills, and overall trustworthiness (Gould et al., 2002). Such athlete expectancies extend to coaches' reputation (i.e., perceptions of their standing and expertise) which can significantly alter athletes' behavior (e.g., effort and persistence) even during first interactions (Manley, Greenless, Smith, Batten, & Birch, 2014). Additionally, Jowett (2008) found that coaches' personal motivation toward their

profession significantly predicted not only their own but also their athletes' satisfaction with the coach-athlete relationship. Comparable findings emerged for the concept of passion (i.e., an important and self-defining activity in which one invests significant time and energy; Vallerand et al., 2003) with more passion from coaches being associated with higher quality coach-athlete relationships. However, this effect was only found when passion was not categorized as obsessive (i.e., all-encompassing; Lafreniere, Jowett, Vallerand, Donahue, & Lorimer, 2008).

Similarly, athletes also possess certain character traits which make them more coachable and thus enhance the coach-athlete relationship. For example, Favor (2011) concluded that more coachable athletes are generally more emotionally stable and agreeable. In contrast, coaches perceive athletes with high levels of anger and immoderation (e.g., struggling to resist temptations) as well as low levels of cooperation as more difficult to work with. In sum, positive coach-athlete relationships are developed when there is a genuine interest and care for each other from both sides which extends past the athletic context. Negative relationships emerge when they are solely based on the achievement of sport-specific goals (Bennie & O'Connor, 2010; 2012). Furthermore, when coaches interact in an aggressive manner (i.e., assertive, argumentative, hostile, and verbally aggressive; Infante, 1987) they are perceived as less credible by athletes (Mazer, Barnes, Grevious, & Boger, 2013).

This information is valuable and offers information which can help enhance coaching practices and in particular the coach-athlete relationship. However, in order to gain an in-depth understanding of the interactions between coaches and athletes it is essential to further conceptualize this unique relationship and establish a systematic, comprehensive, and empirically grounded foundation for future research. Only such theoretical frameworks or models make it possible to fully understand the dynamic variables and constructs that can

influence the effectiveness of a coach-athlete relationship. Vanden Auwele and Rzewinick (2000) argued that in general an investigation of relationships in sport will benefit if sport psychology professionals consider “theories, concepts and methodologies from other areas of psychology” (p. 576).

### **The 3 C’s + 1 Model**

In line with this recommendation, Jowett and colleagues (Jowett, 2003; 2006; Jowett & Cockerill, 2003; Jowett & Meek, 2000; Jowett & Ntoumanis, 2004) developed a conceptual model to specifically explore the coach-athlete relationship from an interpersonal perspective. This was done to adequately understand the nature of dyadic relationships (i.e., two members) in the athletic context. The framework is based on Kelley et al.’s (1983) definition of interpersonal relationship and therefore suggests that the emotions, thoughts, and behaviors of relationship members are interrelated. Thus, it is necessary to investigate both dyad participants simultaneously in order to fully capture the relationships’ bi-directional nature (Poczwadowski, Barrot, & Henschen, 2002) and provide a more in-depth understanding of such dynamics (Mikulincer, 1998). In the development of their framework Jowett and colleagues (Jowett, 2003; 2006; Jowett & Cockerill, 2003; Jowett & Meek, 2000; Jowett & Ntoumanis, 2004) integrated the interpersonal constructs of closeness (Berscheid, Snyder, & Omoto, 1989), coorientation (Newcomb, 1953), and complementarity (Kiesler, 1997) which had previously been explored separately within the literature.

**Closeness.** Closeness is operationalized as “an affective or emotional interdependence” (Jowett & Meek, 2000, p. 159). It is an emotional connection and familiar feeling between coaches and athletes. Therefore, closeness entails feelings of intimacy, trust, liking, respect, belief, and commitment (Jowett & Cockerill, 2003). This embodies what has been referred to as

the personal and humanistic side of coaching (Bloom, Durant-Bush, & Salmela, 1997) which is characterized by coaches' genuine interest in athletes' well-being and development. Humanistic coaches are sincerely trying to help and support athletes. This creates an emotional bond, belief, and commitment between coach and athlete (Jowett & Meek, 2000) who are able to trust one another (Jowett & Ntoumanis, 2004).

**Coorientation.** Coorientation is operationalized as “the coach and athlete’s verbal interactions whereby its exact nature is sought and addressed” (Jowett & Meek, 2000, p. 159). These interactions develop a shared perspective and common frame of reference (i.e., goals, beliefs, values, and expectations; Jowett & Cockerill, 2003) through open channels of communication (Jowett, 2006). Such exposure to one another allows coaches and athletes to share experiences, beliefs, values, thoughts, and also worries. Specifically, coorientation allows coaches and athletes to share knowledge emerged from self-disclosure and information exchange as well as common understanding through goal setting and social influence. Thus, it signifies the manner in which they are mutually and causally interrelated (Adie & Jowett, 2010). Such dynamics allow both relationship members to be ‘on the same page’ and mutually contribute to the dyad’s success (Jowett & Cockerill, 2003), which prevents incompatibility, dissatisfaction, and underachievement (Jowett & Meek, 2000).

**Complementarity.** Complementarity is operationalized as “the type of interaction that the dyad perceives as cooperative and effective” (Jowett & Meek, 2000, p. 160). Hence, it is the behavioral counterpart to coorientation and offers the foundational motivations as well as resources for the relationship. Complementarity is characterized by reciprocal interpersonal behavior and support founded in readiness, easiness, and friendliness (Adie & Jowett, 2010). By holding and acknowledging individual roles and tasks both members of the relationship are able

contribute to the dyad's success in a corresponding manner. Coaches and athletes can focus on their respective competencies and therefore channel all their personal efforts towards achieving their mutual goals (Jowett & Ntoumanis, 2004). For example, the coach may have the necessary knowledge to help the athlete develop and improve, who in turn can focus entirely on the process of physical and psychological preparation (Jowett & Cockerill, 2003).

Finally, Jowett and Ntoumanis (2004) developed the Coach-Athlete Relationship Questionnaire (CART-Q) in order to measure the different contributing elements (i.e., closeness, coorientation, and complementarity) of the interpersonal relationship between coaches and athletes. Factor analyses validated closeness and complementarity as identifiable constructs. However, coorientation was eliminated and instead replaced by commitment. Jowett and Ntoumanis (2004) defined this new component as “coaches’ and athletes’ intention to maintain their athletic relationship” (p. 249-250). Hence, it is the willingness to trust the respective abilities to either lead (i.e., coach) or perform (i.e., athlete). In subsequent work Jowett (2006) re-established coorientation as a valid construct of the dyad. Therefore, some researchers now conceptualize the effectiveness of the coach-athlete relationship in terms of the 3+1 Cs (i.e., closeness, commitment, complementarity, and coorientation). Combined these elements highlight how “coaches’ and athletes’ feelings (closeness), thoughts (commitment), and behaviors (complementarity) are interconnected (coorientation)” (Olympiou, Jowett, & Duda, 2008, p. 427) and therefore influence the overall effectiveness of athletic dyads.

### **The Motivational Model of the Coach-Athlete Relationship**

Alternatively, Mageau and Vallerand (2003) proposed a model that explores the coach-athlete relationship to explain how coaches influence athletes’ motivation. This appears valuable as motivation determines “the intensity and direction of effort” (Hollembek & Amorose, 2005,

p. 20) and directly impacts athletes' affect, cognition, and behavior (Vallerand & Losier, 1999). Researchers have found empirical links between various social-contextual events, such as rewards, feedback, imposed deadlines, competition, surveillance, and interpersonal styles on individuals' motivational patterns (Deci, Koestner, & Ryan, 2001; Henderlong & Lepper, 2002; Ryan & Deci, 2002; Vallerand & Losier, 1999). This further highlighted the importance of coaches as they are typically able to meaningfully affect all these events. For example, coaches are able to offer feedback and rewards or impose rules. Therefore, the effect of relationships and interactions between coaches and athletes on athletes' motivation is an important consideration in the development of their performance, well-being, and satisfaction.

### **Behavioral Regulation**

Mageau and Vallerand's (2003) model depicts the coach-athlete relationship as a motivational sequence grounded in self-determination theory (Deci & Ryan, 2000). The outcome or final piece of this structure is athletes' personal motivation. Deci and Ryan (1980) suggested that an individual (e.g., athlete) can demonstrate different types of motivation or behavioral regulation. Whereas an amotivated person exhibits no desire to engage in a task, an intrinsically motivated person does a behavior primarily for the pure enjoyment of learning, accomplishing tasks, and experiencing sensations in the process. In this context, an intrinsically motivated person is not outcome-oriented but rather motivated by participation in the activity itself. Between amotivation and intrinsic motivation lies a spectrum of potential extrinsic forms of regulation that can contribute to an individual's reason to participate in a behavior. Amongst these behavioral regulations are external (to receive rewards or avoid punishment), introjected (out of self-imposed pressure), identified (to aid in the achievement of another related goal), and integrated regulation (to confirm one's sense of identity). External and introjected regulations are

characterized as non-self-determined behaviors, meaning the motivation depends on sources completely or partially external to the individual. In contrast, identified and integrated regulations are considered to be self-determined in that behaviors are driven from factors completely within the person (Deci & Ryan, 1980). It appears valuable to foster optimal motivation within individuals (i.e., self-determined extrinsic and intrinsic motivation) as athletes who were self-determined gave more effort, showed greater persistence, performed better, experienced lower levels of performance-related anxiety, and had higher levels of well-being in and out of sport compared to athletes who did not demonstrate self-determined motivation (Gillet, Berjot, & Gobance, 2009; Mack et al., 2011; Podlog & Dionigi, 2010; Vallerand, 1997; Vallerand & Losier, 1999). Thus, an effective coach-athlete relationship is aimed at increasing athletes' self-determined extrinsic and intrinsic motivation.

### **Basic Psychological Need Satisfaction**

In order to cultivate these optimal motivational patterns and foster the subsequent benefits it is important to enhance athletes' satisfaction of their inherent basic psychological needs of competence (the need to interact effectively with the environment), autonomy (the need to be the director of one's actions that are in accordance with one's values), and relatedness (the need to be a valued and accepted member of a group; Deci & Ryan, 2000). If individuals feel competent, they have a sense of being able to perform at a level that is appropriate for the setting. Similarly, autonomy is fulfilled when individuals have a certain amount of meaningful choice in decisions rather than being dictated solely by others. Finally, relatedness refers to a sense of being an accepted member of the group and feeling comfortable in one's role (Deci & Ryan, 2000). These basic psychological needs can be influenced by various social factors in the

environment (e.g., competition/cooperation, success/failure, and coaches' behaviors toward athletes; Vallerand & Losier, 1999).

### **Autonomy-supportive Behaviors**

According to Mageau and Vallerand's (2003) motivational model of the coach-athlete relationship, athletes' need fulfillment and subsequent motivation are primarily influenced by coaches' behaviors (i.e., autonomy-supportive behaviors, structure, and involvement). In general, the literature has identified two main coaching styles or categories of interpersonal behavior. Coaches can either adapt a controlling style which is characterized by a highly-directive manner or an autonomy-supportive style which empowers athletes and leaves room for their input (Vallerand & Losier, 1999). This encompasses the central consideration of internalization versus compliance in regards to athletes' behavioral engagement and values in their sport participation (i.e., self-determined versus non-self-determined). Ideally "coaches should want to transmit their sport's values and not merely induce behaviors" (Mageau & Vallerand, 2003, p. 886) which can be achieved through the use of autonomy-supportive behaviors. In this context, being autonomy-supportive entails that "an individual in a position of authority [coach] takes the other's [athlete's] perspective, acknowledges the other's feelings, and provides the other with pertinent information and opportunities for choice, while minimizing the use of pressures and demands" (Black & Deci, 2000, p. 742). Autonomy support further denotes that "athletes are regarded as individuals deserving self-determination, and not mere pawns that should be controlled to obtain a certain outcome" (Mageau & Vallerand, 2003, p. 886). This allows people a certain amount of freedom to act upon their own interests and values which consequently nurtures a sense of volition and psychological freedom. When acting autonomously individuals perceive their behavior to originate from within and express their true selves as opposed to being determined



by an external source (e.g., coach; Deci & Ryan, 1987). Numerous researchers have found that the more athletes evaluated their coaches to be autonomy-supportive as opposed to controlling the more competent, autonomous, and related they felt (e.g., Adie, Duda, & Ntoumanis, 2008, 2012; Amorose & Anderson-Butcher, 2007; Banack, Sabiston, & Bloom, 2011; Gagne, 2003; Hollembeak & Amorose, 2005).

For example, Adie and colleagues (2012) tested the hypothesized sequence between athletes' perceptions of autonomy support provided by coaches and their subsequent basic psychological need satisfaction. A total of 54 male soccer players between the age of 11 and 18 participated in the study and indicated the degree to which they perceived their head coach to be autonomy-supportive as well as their need fulfillment. The study employed a longitudinal design assessing these variables at six time points over the course of two competition seasons (i.e., beginning, middle, and end of each season). Results of multi-level regression analyses showed that perceived autonomy support predicted changes in athletes' perceptions of all three basic psychological needs. This was evident for both within-person changes and between-person mean differences for competence ( $\beta = .20; p < .001; \beta = .25; p < .001$ ), autonomy ( $\beta = .22; p < .001; \beta = .37; p < .001$ ), and relatedness ( $\beta = .07; p < .001; \beta = .50; p < .001$ ) over the course of the two seasons. Previous researchers (e.g., Reinboth, Duda, & Ntoumanis, 2004) had frequently only examined the effect of autonomy support on perceptions of one particular need (e.g., autonomy). In contrast, the findings of Adie et al. (2012) indicated that autonomy-supportive behaviors do indeed nurture all three basic psychological needs as proposed by Mageau and Vallerand's (2003) conceptual model of the coach-athlete relationship. Based on these results Adie et al. (2012) concluded that environments created by coaches which are "perceived to empower athletes with choices and decision making (i.e., autonomy support), which conveys trust in their

abilities whilst utilizing non-controlling feedback (i.e., competence support), and that takes and respects their perspective (i.e., relatedness support)” help foster athletes’ need fulfillment. Furthermore, these findings supported the notion that social factors in the environment (e.g., coaches) directly influence individuals’ need fulfillment (Vallerand, 1997).

In a similar study, Amorose and Anderson-Butcher (2007) also explored the conceptual link between an autonomy-supportive coaching style and athletes’ perceptions of competence, autonomy, and relatedness. 246 collegiate and 335 high school athletes from a variety of sports were asked to rate their perceptions of the autonomy-supportive behaviors demonstrated by their coaches as well as their basic psychological need satisfaction. Descriptive statistics indicated a difference in perceived autonomy support based on competitive level. Specifically, college athletes perceived their coaches to be less autonomy-supportive compared to participants at the high school level. This was consistent with findings by Horn (2002) who suggested that environmental factors (e.g., competitive level) can have an influence on coaches’ behaviors (e.g., autonomy support). In addition, results of structural equation modeling showed that perceived autonomy support from their respective coach was a statistically significant predictor for athletes’ perceptions of competence ( $\beta = .22; p < .05$ ), autonomy ( $\beta = .81; p < .05$ ), and relatedness ( $\beta = .51; p < .05$ ). Thus, “the degree to which the athletes perceived their coaches to be autonomy-supportive in their interactions positively related to each of the three needs” (Amorose & Anderson-Butcher, 2007, p. 666). This again supported the notion that while autonomy support was the statistically strongest predictor for autonomy such interpersonal behavior from the coach had an influence on all three basic psychological needs.

Hence, given the meaningful influence of autonomy-supportive coaching it is important to gain a more in-depth understanding of this interpersonal construct. In previous models

(Vallerand & Pelletier, 1985) and empirical studies (Vallerand & Losier, 1999) researchers often conceptualized coaches' behaviors solely as a dichotomy of controlling (i.e., highly-directive; Vallerand & Losier, 1999) and autonomy-supportive (i.e., athlete-centered; Vallerand & Losier, 1999). Furthermore, autonomy support has frequently been operationalized simply as providing choice (e.g., Zuckerman, Porac, Lathin, Smith, & Deci, 1978) which does not comprehend the complexity of the construct with its multiple facets (Mageau & Vallerand, 2003). In contrast, to further conceptualize autonomy support Mageau and Vallerand (2003) proposed seven specific behaviors which extend the previous definitions:

- (1) provide as much choice as possible within specific limits and rules; (2) provide a rationale for tasks, limits and rules; (3) inquire about and acknowledge others' feelings; (4) allow opportunities to take initiatives and do independent work; (5) provide non-controlling competence feedback; (6) avoid overt control, guilt-inducing criticism, controlling statements and tangible rewards; and (7) prevent ego-involvement (p.886).

These more explicitly defined behaviors embody a more multi-faceted view of an autonomy-supportive interpersonal style. Thus, these strategies offer practical suggestions which allow coaches to nurture athletes' need fulfillment and consequently self-determined extrinsic and intrinsic motivation (Mageau & Vallerand, 2003).

First, giving athletes choices within rules and limits allows them to take ownership of their participation and their team. Athletes tend to respond positively if they feel like they have an input on team decisions. This does not suggest giving athletes complete control but rather allowing them choices within the structure of the team or environment. Second, there are times when it is not practical or appropriate to offer choice. In these situations, it is valuable to instead provide athletes with a rationale for decisions. Furthermore, offering reasoning for tasks helps

athletes to engage in activities with more purpose and therefore nurtures the internalization of their underlying reasons. Third, it is valuable to consider and acknowledge athletes' feelings and perspectives. This communicates that they are being valued as people who have specific needs and emotions, rather than just athletes or mere pawns that need to be directed to perform on the field. Fourth, while guidance from coaches is valuable and often necessary it should only be offered when needed. Granting opportunities to solve problems independently allows athletes to take ownership of their own performance. Similarly, being able to take initiative and use their creativity enhances their self-initiated behavior. Fifth, competence feedback is essential for athletes' development. However, when correcting mistakes, it is important to do so in a constructive manner. This means focusing on what can be improved and what is within athletes' control instead of what was done wrong and is outside their control. Hence, controlling 'should' or 'have to' statements should be avoided. Instead feedback is most effective when it is focused on informational content. Sixth, similar to avoiding controlling competence feedback it is important to restrain from using overt control, controlling statements, guilt-inducing criticism, and tangible rewards. The threat of physical power and withdrawal of material resources or privileges as well as the contingency of acceptance (i.e., acceptance based on other variables) influences athletes negatively. Seventh, coaches should try to avoid ego-orientation in the athletes they work with, which is characterized by a focus on outperforming teammates or opponents and places the primary source of comparison on others' accomplishments. In contrast, task-orientation, which is focused on learning, improvement, or mastering a task places the emphasis is on increasing previous personal performance (Mageau & Vallerand, 2003). In sum, Mageau and Vallerand (2003) conceptualized autonomy support as more than the provision of choice. They rather provided seven specific behaviors which are grounded in extensive empirical

evidence (see Mageau and Vallerand, 2003). Although a majority of the supporting research was conducted in the educational context it is reasonable to suggest that these findings hold evident in the sport domain. Nevertheless, there is a need for additional studies to further test the effects of these strategies in the athletic environment.

## **Structure**

From a practical perspective it is important to note that an autonomy-supportive interpersonal style is different from a laissez-faire approach and does not infer offering complete independence to the learner (Mageau & Vallerand, 2003). Consequently, these autonomy-supportive behaviors are most beneficial when coaches also provide optimal structure. In general, the provision of structure is one of the most important tasks of any socializer (e.g., coach; Curran, Hill, & Niemic, 2013) as it offers clear directions, valuable information about expectations, and guiding behavioral strategies. Such feedback is necessary for athletes to achieve desired results and thus feel confident in their ability. Furthermore, structure is in direct contrast to chaos in which socializers are “confusing or contradictory, fail to communicate clear expectations and directions, and ask for outcomes without articulating the means to attain them (Jang, Reeve, & Deci, 2010). This explains why “without coaches’ instruction and structure, athletes lack the necessary information and experience to progress in their discipline” (Mageau & Vallerand, 2003, p. 893). Thus, Mageau and Vallerand (2003) proposed that the structure instilled by the coach has a direct effect on athletes’ perception of competence. This assumption has been supported by multiple researchers (e.g., Curran et al., 2013; Vansteenkiste et al., 2012) and individuals are only able to interact competently with their environment when the appropriate structure is in place (Grolinick & Ryan, 1989). Thus, structure is not to be confused with control, which is characterized by demands, insistences, sanctions, and inflexible rules

(Jang et al., 2010). However, most studies on structure have been conducted in the education domain (e.g., Jang et al., 2010; Sierens, Vansteenkiste, Goossens, Soenens, & Dochy, 2009; Vansteenkiste et al., 2012) creating a gap of empirical evidence in the athletic context.

As an exception Curran and colleagues (2013) assessed the influence of structure instilled by coaches on 281 youth soccer players' ( $M = 13.67$ ;  $SD = 1.49$ ) basic psychological need satisfaction. Additionally, they attempted to extend Mageau and Vallerand's (2003) coach-athlete relationship model which only proposed a relationship between structure and the need for competence. In contrast, Curran et al. (2013) argued that structure from coaches may affect athletes' perceptions of all three basic psychological needs; an assumption that was supported by the data ( $\beta = .33$ ;  $p < .001$ ). Furthermore, the findings indicated that this relation was moderated by autonomy support. Thus, coaches are able to support athletes' need satisfaction more when they "provide structure with support for choice, volition, and self-initiation (autonomy support) rather than in a context of pressure to think, feel, and behave in particular ways (control)" (Curran et al., 2013, pp. 38-39). In the literature there are three main ways this relation between autonomy support and structure has been conceptualized: antagonistic (i.e., opposites in their effect), curvilinear (i.e., with varying levels), and independent (i.e., entirely distinct; Jang et al., 2010). The results by Curran et al. (2013) suggested that structure and autonomy support interact synergistically in predicting perceptions of competence, autonomy, and relatedness. This assumption finds support in the conclusions of Jang and colleagues (2010), who showed that the two constructs positively covaried. Thus, autonomy support and structure appear to be separate yet positively related (Curran et al., 2013; Jang et al., 2010; Sierens et al., 2009; Vansteenkiste et al., 2012) and it is an ideal use or combination of both behaviors which optimally fosters self-determined extrinsic and intrinsic motivational outcomes.

## **Involvement**

In addition, as previously mentioned coaches are frequently considered mentors and parental figures (Gould et al., 2002; Jowett & Cockerill, 2003). Their support and involvement in athletes' well-being plays an important role in the development of their enjoyment (Ommundsen & Vaglum, 1991) and motivation (Pelletier et al., 1995). "Without their coach's support and involvement, athletes cannot feel connected" (Mageau & Vallerand, 2003, p. 893) in their sport environment. Therefore, coaches' involvement directly influences athletes' perceptions of relatedness (Reinboth et al., 2004) and need fulfillment can be enhanced by coaches who not only focus their efforts on developing the athlete as a competitor, but also as a person (Jowett & Cockerill, 2002). In general, it is difficult for athletes to trust coaches who do not show an interest in them on a personal level or can have a conversation about something non-sport related (Beenie & O'Connor, 2012). Thus, involvement is characterized by a close, caring, and supportive relationship and has been derived from the concept of social support. It is most effective when it is offered without contingencies (e.g., based on performance outcomes; Reinboth et al., 2004) or conditionally (i.e., expecting a return; Keegan et al., 2010). Also, while people may be concerned about over involvement (e.g., in youth sport) Anderson, Manoogian, & Reznick (1976) concluded that a lack of involvement was even worse for children's motivational patterns than a controlling behavior.

In the literature the related concept of social support has received extensive consideration and has shown to meaningfully enhance individuals' physical and mental welfare (e.g., DeFreese & Smith, 2013; Kritiansen & Roberts, 2010; Rees & Hardy, 2000) and is therefore integral to effective coaching (Antonini Philippe & Seiler, 2006; Kritiansen & Roberts, 2010). Bianco and Eklund (2001) suggested that social support is a multidimensional construct which consists of

emotional (i.e., listening, comforting, and challenging), informational (i.e., confirming, appreciating, and motivating), and tangible support (i.e., material and personal assistance). Ryan and Solky (1996) suggested that the positive effects of social support are due to its influence on people's basic psychological needs and in particular the need for relatedness. To support this assumption, Reinboth and colleague (2004) used structural equation modeling analyses to show that coaches' social support was a statistically significant predictor for athletes' perceptions of relatedness ( $\beta = .63$ ;  $p < .01$ ).

Similar to the suggested synergistic relationship between autonomy support and structure (Curran et al., 2013; Jang et al., 2010; Sierens et al., 2009; Vansteenkiste et al., 2012) Reynolds and McDonough (2015) proposed that such an interaction may also exist between autonomy support and involvement, which was another attempt to extend Mageau and Vallerand's (2003) model. Reynolds and McDonough (2015) argued that "a youth whose coach is autonomy supportive but not close and emotionally supportive may feel uncared for, while an involved coach who is not autonomy supportive may be perceived as controlling" (p. 52). This appears justified as comparable results were found in research with participants of a physical activity program (McDonough, Ullrich-French, Anderson-Butcher, Amorose, & Riley, 2013). In their study with 142 youth soccer players ( $M = 13.38$ ;  $SD = .97$ ) Reynolds and McDonough (2015) showed that autonomy support was indeed more effective in predicting need fulfillment and motivation when supported by a caring coach-athlete relationship (i.e., involvement moderated the relationship between autonomy support and basic psychological need satisfaction). Thus, they concluded that coaches who demonstrate "care and emotional support for the athletes they work with, and devote time and effort to getting to know them, their efforts to provide athletes with opportunities for choice and voice, and to understand the sport context from their



perspective” (Reynolds & McDonough, 2015, p. 58) produce more optimal motivational outcomes.

### **Determinants for Coaches’ Use of Autonomy-supportive Behaviors**

As the last piece within the motivational sequence of their coach-athlete relationship model Mageau and Vallerand (2003) proposed three main determinants for coaches’ use of autonomy-supportive behaviors. Explicitly, coaches’ personal orientation, coaching context, and perceptions of athletes’ behavior and motivation regulate whether they employ an autonomy-supportive approach when working with athletes. While these assumptions are primarily based on research within education (e.g., Deci, Spiegel, Ryan, Koestner, & Kauffman, 1982; Martinek, 1981; Reeve, Bolt, & Cai, 1999) it appears reasonable to suggest that these findings could be replicated within the sport context (Mageau & Vallerand, 2003).

**Coaches’ personal orientation.** Just as there are autonomy-supportive and controlling coaching interpersonal behaviors this dichotomy can also be found at the personality level (Mageau & Vallerand, 2003). Individuals with an autonomy-supportive orientation generally respect and value subordinates’ (e.g., athletes) need for autonomy (Reeve et al., 1999) and thus employ more autonomy support in their work (Pelletier et al., 2001). Reeve and colleagues (1999) adapted a dispositional approach in their research and supported this assumption in two related studies. In a first study with 61 pre-service teacher dyads one member was assigned to be a teacher with the other assuming the role of a student in a lab-based setting. Teachers self-assessed their motivational interpersonal style and were subsequently asked to help their ‘student’ learn to solve a puzzle. Reeve et al. (1999) revealed that an autonomy-supportive style significantly correlated with several demonstrated autonomy-supportive behaviors. For example, teachers were more likely to listen to students, ask about their wants, respond to questions, and

take their perspective than their controlling counterparts. Simultaneously, teachers with a more autonomy-supportive orientation were less likely to hold instructional material, use directives, and simply reveal salutations. Overall, these behaviors then predicted students' intrinsic motivation. In a second study, 32 elementary and 14 high school teachers again self-assessed their interpersonal style. Next, they were asked to describe an actual in-class episode in which they had tried to motivate a student. Analyses revealed a statistically significant correlation between motivating style and intrinsic motivation [ $r(46) = .45, p < .01$ ]. In sum, individuals with an autonomy-supportive personal orientation appeared to utilize more supportive behaviors in their interactions (Pelletier et al., 2001; Reeve et al., 1999).

In regard to those behaviors researchers within coach leadership generally acknowledge three different types of coaching behavior: required (i.e., behavior that is necessary based on sport, situation, and athlete characteristics), actual (i.e., actual behavior demonstrated by the coach), and preferred (i.e., behavior preferred by athletes; Chelladurai, 1993). Furthermore, Chelladurai (1993) postulated that athletes' performance and satisfaction are based on the degree of congruence among the three types of coaching behavior. While the benefits of an autonomy-supportive interpersonal style have been well established by researchers (e.g., Adie et al., 2008, 2012; Amorose & Anderson-Butcher, 2007) suggesting they should be considered as required and preferred leadership behavior "Western culture still promotes a controlling style of teaching and coaching" (Mageau & Vallerand, 2003, p. 895). It is often expected for authority figures to behave in a directive manner and an autonomy-supportive coach may be perceived as inadequate (Mageau & Vallerand, 2003). In fact, in the educational setting Boggiano, Flink, Shields, Seelbach, and Barrett (1993) found that controlling teachers were generally perceived to be more competent. In addition, they were further thought to be more interested in and enthusiastic about

their profession (Flink, Boggiano, & Barrett, 1990). In sport, training and competitions are typically scheduled in advance creating inflexible deadlines. Coaches are further responsible for the evaluation of athletes and frequently utilize task-contingent rewards. Such contextual factors often play a meaningful role in determining actual leadership behaviors (Deci & Ryan, 1987) and perhaps therefore many coaches still develop more controlling interpersonal styles (Mageau & Vallerand, 2003).

**Coaching context.** Sarrazin, Trouilloud, Tessier, Chanal, and Bois (2005) found that physical education teachers preferred a controlling style in 95% of all interactions. In particular, when reminded of their responsibility to be successful authority figures typically use more directives, criticism, and controlling questions (Deci et al., 1982). Consequently, contextual factors or pressure should be considered as meaningful antecedents to coaches' interpersonal behavior. This pressure can stem from various sources in the environment. For example, coaches can feel pressure to compare and out-perform other coaches. Practices and competitions pose situational factors which require constant decision-making on the coaches' behalves. Furthermore, there are expectations from administration and spectators not only about how to run the team but particularly certain outcomes. Especially at the elite level coaches are typically expected to guide athletes to successful competitions (i.e., wins, Rocchi, Pelletier, & Couture, 2013). Consequently, many coaches adopt more controlling interpersonal styles, which might serve to enhance their perception of influence and thus nurture the feeling that they do everything in their power to win (Mageau & Vallerand, 2003). When reminded of their responsibility to be successful authority figures typically use more directives, criticism, and controlling questions compared to those without that outcome-orientation (Deci, Spiegel, Ryan, Koestner, & Kaufman, 1982). Factors such as performance evaluation, cultural norms, and time

constraints can have a meaningful influence on interpersonal behavior (Taylor, Ntoumanis, & Smith, 2009). Similarly, the experience of stress depletes individuals' psychological resources making them less likely to take others' perspective into consideration and therefore less likely to engage in autonomy-supportive behavior (Zussman, 1980).

In sum, when faced with an increasing pressure to perform and high levels of stress individuals tend to employ more controlling behaviors. In a study with 418 coaches Stebbings, Taylor, Spray, and Ntoumanis (2012) found that contextual factors such as opportunities for professional development ( $\beta = .18$ ; 95%  $CI = .09$  to  $.27$ ), job security ( $\beta = .19$ ; 95%  $CI = .10$  to  $.29$ ), as well as low work-life conflict ( $\beta = -.08$ ; 95%  $CI = -.14$  to  $-.01$ ) significantly predicted coaches' use of autonomy-supportive behaviors. This relationship was mediated by basic psychological need satisfaction and well-being which has been defined as "a dynamic and relative state where one maximizes his or her physical, mental, and social functioning in the context of supportive environments to live a full, satisfying, and productive life" (Koba, Sneizek, & Zack, 2009, p. 4). Overall, well-being accounted for 55% of the variance of coaches' autonomy support and therefore appears to be another noteworthy determinant of interpersonal behavior.

**Coaches' perceptions of athletes' behavior and motivation.** As a particularly meaningful contextual factor the individual athletes coaches work with are important determinants of coaches' behavior in their own right. Specifically, the way coaches evaluate athletes' behavior (e.g., effort) and motivation influences their own interpersonal style (Mageau & Vallerand, 2003). For example, when coaches perceive athletes to be low in self-determined motivation they are less likely to engage in autonomy-supportive behaviors (Courneya & McAuley, 1991). These results were supported by Sarrazin, Tessier, Pelletier, Trouilloud, and

Chanal (2006) who found that teachers supported students' autonomy more when they perceived their motivation to be high. Sarrazin and colleagues (2006) attempted to explain these common findings in that "passivity is aversive. It may make a teacher feel incompetent or unliked by the student" (p. 297). Furthermore, coaches may feel like they have to externally motivate (i.e., control) such non-self-determined athletes more and might therefore not engage in an autonomy-supportive style. Mageau and Vallerand's (2003) proposition that expectancies influence behavior finds support in the literature regarding the widely-researched concept of the self-fulfilling prophecy which Merton (1948) coined as individuals' belief or expectations influencing them to behave in a certain way. This holds evident even if the initial perceptions were false (Rosenthal & Rubin, 1978).

While Mageau and Vallerand (2003) offered an extensive conceptual model Rocchi and colleagues (2013) extended their framework and identified coaches' own motivation as the central predictor of autonomy support. In their study Rocchi et al. (2013) combined aspects of the coaching context and perceptions of athletes' motivation to further assess antecedents of coaches' interpersonal behavior. However, in contrast to Mageau and Vallerand's (2003) assumptions Rocchi et al. (2013) hypothesized the influence of those elements to be indirect rather than direct (i.e., mediated by motivation). Therefore, they employed structural equation modeling to analyze the relationships between pressure from above (i.e., pressure created by coaching colleagues, practice demands, and the administration), pressure from below (i.e., perceptions of athletes' motivation), autonomy support, and motivation. Results of the research assessing all variables for 303 youth development coaches revealed an ideal fit for a model "where coach motivation fully mediated the relationship between pressure from above and autonomy-supportive behaviours [sic], and partially mediated the relationship between pressure

from below and autonomy-supportive behaviours [sic]" (Rocchi et al., 2013, p. 856). This suggested that coaches perceived contextual pressures (i.e., pressure from above) affected their motivation ( $\beta = -.24$ ;  $p < .01$ ) which then in turn predicted their use of autonomy-supportive behaviors ( $\beta = .30$ ;  $p < .01$ ). In contrast, coaches' perceptions about athletes' motivation had a direct ( $\beta = .23$ ;  $p < .01$ ) and indirect impact on autonomy support (i.e., mediated by motivation;  $\beta = .12$ ;  $p < .001$ ; Rocchi et al., 2013). These results were in line with the results of Pelletier, Seguin-Levesque, and Legault (2002) who found a similar sequence in their research with teachers. Thus, while the findings of Rocchi et al.'s (2013) study further support Mageau and Vallerand's (2003) proposed antecedents of autonomy-supportive behaviors they also highlighted additional relationships between these variables. This indicated that there are still gaps within the literature regarding coaches' interpersonal behaviors and that the coach-athlete relationship has still not been explored comprehensively.

### **Behavior Change**

Regardless of the benefits of utilizing autonomy-supportive coaching, "Western culture still promotes a controlling style of teaching and coaching" (Mageau & Vallerand, 2003, p. 895). Based on the available research, it appears that there are various personal and contextual factors that influence coaches to employ more controlling interactions with the athletes they work with. Thus, it appears reasonable to suggest that it would be valuable to affect coaches' perceptions toward an autonomy-supportive interpersonal style. This would help foster athletes' basic psychological needs and therefore enhance their overall sport experience. There are various theoretical approaches to understanding such behavioral modification. In 1991 the National Institute of Mental Health organized a workshop including five of the most accomplished theorists in the field of behavior change: Albert Bandura, Marshall Becker, Martin Fishbein,

Frederick Kanfer, and Harry Triandis. Although these experts could not reach a decision on a common theoretical structure they agreed that for a person to engage in a given behavior one or more of the following must be true:

- (1) The person has a strong positive intention (or made a commitment to perform the behavior,
- (2) There are no environmental constraints that make it impossible for the behavior to occur;
- (3) The person has the skills necessary to perform the behavior;
- (4) The person believes that the advantages (benefits, anticipated positive outcomes) of performing the behavior outweigh the disadvantages (cost, anticipated negative outcomes); in other words, the person has a positive attitude toward performing the behavior;
- (5) The person perceives more social (normative) pressure to perform the behavior than to not perform the behavior;
- (6) The person perceives that performance of the behavior is more consistent than inconsistent with his or her self-image or that its performance does not violate personal standards that activate negative self-sanctions;
- (7) The person's emotional reaction to performing the behavior is more positive than negative;
- (8) The person perceives that he or she has the capabilities to perform the behavior under a number of different circumstances; in other words, the person has perceived self-efficacy to execute the behavior in question (Fishbein & Ajzen, 2010, p. 19).

### **The Reasoned Action Approach**

One framework that incorporates several of these suggested factors and has been widely utilized to explain attitude and behavior change is Fishbein and Ajzen's (2010) reasoned action approach. This theory has been developed over multiple years and been successfully employed in various contexts to explain behavior change. While evidence within the sport environment is

limited there is ample support for its applicability and effectiveness within the related fields of exercise and physical activity (e.g. Armitage & Conner, 2001; Godin & Kok, 1996; Hagger, Chatzisarantis, & Biddle, 2002). The reasoned action approach (Fishbein & Ajzen, 2010) is based on the assumption that behavioral intention, which is “the person’s estimate of likelihood or perceived probability of performing a given behavior” (Fishbein & Ajzen, 2010, p. 39) determines behavior. “This intention remains a behavioral disposition until, at the appropriate time and opportunity, an attempt is made to translate the intention into action” (Ajzen, 2005, p. 99). Hence, the stronger this motivation or commitment the more likely it is that the person will engage in the behavior (Fishbein & Ajzen, 2010).

### **Intentions**

In Fishbein and Ajzen’s attempt to understanding intentions and behavior change they initially developed the Theory of Reasoned Action (TRA; Ajzen & Fishbein, 1980). According to the TRA (Ajzen & Fishbein, 1980) individuals’ intentions to engage in a behavior are influenced by their attitude and subjective norm. In his succeeding research Ajzen (1988) introduced perceived behavioral control as an additional determinant of intentions and thus proposed the Theory of Planned Behavior (TPB). Therefore, TBA (Ajzen, 1988) was developed as an extension of TRA (Ajzen & Fishbein, 1980). Subsequently, Fishbein and Ajzen have further developed their reasoned action approach and introduced various additional nuances that provide a more in-depth understanding of behavior change (Fishbein & Ajzen, 2010). The following discussion highlights the most recent version of their approach (see Figure 1).

### **Attitude**

Attitude is often considered the main determinant of human behavior and in his early review of the construct Allport (1935) stated “the concept of attitudes is probably the most



distinctive and indispensable concept in contemporary American social psychology” (p. 784). Attitude is considered to be “a latent disposition or tendency to respond with some degree of favorableness or unfavorableness to a psychological object” (Fishbein & Ajzen, 2010, p. 76). Thus, the variable reflects individuals’ appraisal of a given behavior as a unitary dimension ranging from negative to positive. However, attitude should not be considered the evaluative response in itself but rather a hypothetical disposition that is determined through the respective reaction toward it. In addition, the construct can be conceptually distinguished between an attitude toward general targets (e.g., physical objects, groups, institutions, policies, events) and an attitude toward performing specific behaviors with respect to an object or target (Fishbein & Ajzen, 2010).

Attitude is based on the beliefs individuals form about a behavior. Specifically, beliefs are created by associating the behavior with various characteristics, qualities, and attributes. This means that, “more formally, we define belief as the subjective probability that an object [or behavior] has a certain attribute” (Fishbein & Ajzen, 2010, p. 96). Fishbein and Ajzen (2010) argued that it is likely only a limited number of beliefs that can meaningfully contribute to people’s attitude. They explained that only salient or accessible beliefs are activated subconsciously to evaluate behaviors and consequently form attitude. Therefore, this is not necessarily a deliberate process but “attitudes toward an object are formed automatically and inevitably as new beliefs are formed about the object” (p. 97). This is assumed to be an automatic process that begins when individuals are confronted with the attitude object. Therefore, attitude is likely not formed by more than five to nine beliefs at a time, which are subject to change. This proposes that individuals have preexisting evaluations about attributes and “depending on the strength of the beliefs, the attribute evaluations become associated with

the attitude object and in a process of summation produce the overall attitude toward the object” (Fishbein & Ajzen, 2010, p. 97). Therefore, beliefs contribute to individuals’ attitude in direct proportion to the probability that the behavior is associated with those attributes.

The evaluation process is not always rational and beliefs “can be biased by a variety of cognitive and motivational processes and may be based on invalid or selective information, be self-serving, or otherwise fail to correspond to reality” (Fishbein & Ajzen, 2010, p. 99). In sum, “each belief links the behavior to an outcome, and the outcome’s positive or negative valence contributes to the attitude in direct proportion to the perceived probability that the behavior produce the outcome in question” (Fishbein & Ajzen, 2010, p. 126). Thus, if a behavior’s anticipated outcome is evaluated positively an individual is more likely to engage in the behavior.

### **Perceived Norm**

However, attitude alone is not able to comprehensively predict behavior. In addition to individuals’ personal appraisal it is also influenced by the social environment. People are more likely to engage in behaviors that are accepted and permitted by the group or society (Fishbein & Ajzen, 2010). Such social norms have been defined as “perceived social pressure to perform (or not to perform) a given behavior” (Fishbein & Ajzen, 2010, p. 130) and are also referred to as strict rules, general guidelines, or empirical regularities. People typically adhere to these norms to serve the interest of the larger social system and avoid punishment (i.e., rational choice theory; see Boudon, 2003), to provide meaning regarding appropriate and inappropriate behavior (i.e., symbolic interactionist tradition; see Blumer, 1969), or to adjust to behavioral patterns within their social environment (i.e., social behaviorism; see Karlson, 1992). According to French and

Raven (1959) there are five specific underlying elements that determine social power and thus explain why people are influenced by perceived norm:

- (1) Reward power: We may comply with perceived social pressure because the social agent exerting the pressure is thought to have the power to reward desired behavior; (2) Coercive power: Conversely, the social agent may be able to mete out punishment for noncompliance; (3) Legitimate power: Compliance with perceived social pressure may be based on the belief that the social agent has the right to prescribe behavior due to his or her role or position in a particular group, network, or society at large; (4) Expert power: We may comply with perceived social pressure because of the social agent's knowledge, expertise, skills, or abilities; (5) Referent power: Compliance with perceived social pressure may derive from a sense of identification with the social agent; that is, people may comply because they want to be like the agent (Fishbein & Ajzen, 2010, p. 130).

It is important to note that social pressure can therefore affect behavior regardless of the anticipation of rewards or punishment (Fishbein & Ajzen, 2010).

Both the TRA (Ajzen & Fishbein, 1980) and the TPA (Ajzen, 1985) introduced social or environmental influences in terms of subjective norm. Thus, the frameworks originally proposed that such pressures were limited to individuals' perception of what important others expected or wanted the person to do (i.e., engage in the behavior or not). This assessment provides people with valuable information regarding the potential effectiveness and adaption of the given action, which can offer advantages for information-processing and decision-making (Cialdini, 2001). Nevertheless, in their revised reasoned action approach Fishbein and Ajzen (2010) argued that these descriptive norms only represent one source of perceived societal pressure. In addition, whether others actually perform the behavior themselves can also pose meaningful pressure and

reflects injunctive norms. “Injunctive norms refer to perceptions concerning what should or ought to be done with respect to performing a given behavior, whereas descriptive norms refer to perceptions that others are or are not performing the behavior in question” (Fishbein & Ajzen, 2010, p. 131). The term perceived norms combines descriptive and injunctive elements and therefore embodies a more inclusive and comprehensive description of environmental factors.

Similar to attitude being based on behavioral beliefs, perceived norms are also grounded in specific beliefs. Injunctive norms are determined by the belief that a particular individual or group thinks the person should engage in a behavior. It is assumed that only salient or accessible agents influence injunctive norms. Descriptive norms are based on what others are doing (i.e., the belief regarding a particular individual or group). Initially, both the TRA (Ajzen & Fishbein, 1980) and TPA (Ajzen, 1985) proposed that, “knowing what a referent prescribes may put little or no pressure on a person to carry out that behavior unless that person is motivated to comply with the referent in question” (Fishbein & Ajzen, 2010, p. 137). This suggested that individuals are only influenced by the opinion of others when they have the desire to conform (i.e., when their opinion is valued). However, researchers have found that this impulse actually adds little to nothing to the prediction of injunctive norms (e.g., Budd, North, & Spencer, 1984; Montano, Thompson, Taylor, & Mahloch, 1997; Sayeed, Fishbein, Hornik, Cappella, & Ahern, 2005). Fishbein and Ajzen (2010) suggested that most people want to at least to some extent act in accordance with salient normative referents. Thus, individuals’ motivation to comply is likely not an influential contributor to subjective norms.

### **Perceived Behavioral Control**

As previously indicated, Ajzen (1985) suggested that behavior is also influenced by individuals’ perceived behavioral control. Thus, he expanded the TRA (Ajzen & Fishbein, 1980)

and proposed the Theory of Planned Behavior (TBA; Ajzen, 1985). High perceived behavioral control, which has been defined as “the extent to which people believe that they are capable of performing a given behavior, that they have control over its performance” (Fishbein & Ajzen, 2010, pp. 154-155) entails having the necessary information, skills, opportunities, and resources to perform the behavior successfully and to overcome possible barriers or obstacles (Fishbein & Ajzen, 2010). This construct is conceptually similar to Bandura’s (1977) concept of self-efficacy, which has been defined as the “beliefs in one’s capabilities to organize and execute the courses of action required to produce given attainments” (Bandura, 1997, p. 3). The reasoned action approach (Fishbein & Ajzen, 2010) is only concerned with the “extent to which control factors are believed to be present and are perceived to facilitate or impede performance of the behavior under consideration” (p. 169) and not their nature. Hence, individuals’ perceptions of their ability can be both internal (e.g., skills and willpower) and external (e.g., task demands and actions of others).

Perceived behavioral control is determined by salient or accessible beliefs regarding internal and external control factors. Thus, it is shaped by the “subjective probabilities that particular factors that can facilitate or impede performance of the behavior will be present” (Fishbein & Ajzen, 2010, p. 221). In turn, these beliefs are partially influenced by previous experiences but also depend on observations and other information (e.g., positive encouragement from others). While perceived behavioral control was initially introduced as another predictor of intention (Ajzen, 1985) Ajzen and Madden (1986) argued that behavior is also influenced by actual barriers regardless of intentions. This should not be confused with perceived behavioral control. While actual control indicates peoples’ ability to engage in a behavior, perceived behavioral control is their perceived ability to do so successfully. Consequently, perceived actual

control is assumed to moderate the relationship between intentions and behavior (i.e., when actual control is high the intention-behavior relation is also stronger). This makes perceived behavioral control a unique determinant as it can impact behavior indirectly by affecting intentions and also directly as a proxy of actual control (Fishbein & Ajzen, 2010).

In sum, within their reasoned action approach Fishbein and Ajzen (2010) argued that individuals' intentions to engage in a behavior are determined by their attitude, perceived norm, and perceived behavioral control. This holds evident for single behaviors, behavioral categories, and goals (Fishbein & Ajzen, 2010) and this sequence has been supported by several meta-analyses (e.g., Armitage & Conner, 2001; Godin & Kok, 1996; Hagger et al., 2002). Specifically, the more positive the attitude and perceived norm and the greater the perceived behavioral control the stronger the person's readiness to perform the behavior. The individual variables' (i.e., attitude, perceived norm, and perceived behavioral control) contributions to the prediction of intentions can vary between people and behaviors. For example, one person may be more affected by attitude while another may be influenced primarily by normative considerations. Similarly, individual actions can be impacted by the nature of the behavior (i.e., action, target, context, and time).

In turn, attitude, perceived norm, and perceived behavioral control are determined by individuals' respective beliefs. Thus, it should be noted that while these elements are conceptually independent constructs they can also correlate as they may be based on the same information. Regardless, "it is at the level of beliefs that we obtain substantive information about the considerations that lead people to perform, or not to perform, a given behavior" (Fishbein & Ajzen, 2010, p. 204). Behavioral, injunctive, descriptive beliefs are influenced by background factors, which can be categorized as personal, social, and informational. Among others personal

factors include general attitudes, personality traits, values, emotions, and intelligence. Social factors contain age, gender, race, ethnicity, education, income, and religion. Information factors consist of experience, knowledge, and media exposure (Ajzen, 2005). These factors affect individuals' beliefs depending on how they are interpreted. Individuals can form beliefs based on direct observation as they may try a behavior and experience certain outcomes. They can also accept information from outside sources such as the internet, TV, newspapers, and books. Individuals can also simply infer certain outcomes based on other beliefs that are relevant to the given behavior. In addition, their past behavior and the respective evaluations of that behavior can also have a meaningful influence on future behavior (Hagger et al., 2002).

Ultimately, the stronger the intention the more likely it is that the individual will actually perform the behavior. Thus, intentions are the proximal determinant of behavior and simultaneously mediate the relationship between attitude, perceived norm, perceived behavioral control, and behavior. This sequence has also been supported by several meta-analyses (e.g., Godin & Kok, 1996; Hagger, Chatzisarantis, & Biddle, 2002; Hausenblas, Carron, & Mack 1997). However, behavior also necessitates actual control, which entails that people possess the necessary skills and abilities to overcome any potential environmental barriers. Thus, actual control moderates the effect of intentions on behavior. Furthermore, "intentions that remain stable over time should predict behavior better than intentions that are unstable" (Fishbein & Ajzen, 2010, p. 56). Specifically, if intentions change after they have been measured they will not be able to adequately predict later behavior. In addition, "the greater the number of intervening steps the lower the intention-behavior correlation is likely to be" (Fishbein & Ajzen, 2010, p. 57).

Nevertheless, sometimes people fail to act in accordance with their intentions. This phenomenon has been termed *literal inconsistency* (Fishbein & Ajzen, 2010) and is considered “asymmetric such that people who do not intend to engage in socially desirable behavior tend to act in accordance with their negative intentions, but people who intend to perform the behavior may or may not do so” (Ajzen & Fishbein, 2005, p. 189). Such inconsistencies may be due to the fact that attitude is a mere indicator of underlying hypothetical dispositions. Furthermore, behaviors may differ in terms of the difficulty to perform. Campbell (1963) argued that “literal inconsistency arises because people with moderate dispositions tend to display behaviors consistent with the disposition when the behaviors are easy to perform but not when they are difficult to perform (e.g., actually carry out the intention)” (Ajzen & Fishbein, 2005, p. 190). While it appears plausible that people only act according to their attitude when it is reasonably easy to perform the behavior this notion has not yet been supported by sufficient empirical evidence (Ajzen & Fishbein, 2005).

In an alternative explanation, literal inconsistencies may often simply be due to the fact that people forgot to act upon their intentions (Orbell, Hodkins, & Sheeran, 1997; Sheeran & Orbell, 1999). This can be effectively countered by prompting people to form *implementation intentions* (Gollwitzer, 1999). That is “simply asking people when, where, and how they will carry out their intentions greatly increases the likelihood that they will do so” (Ajzen & Fishbein, 2005, p. 190). These reminders increase the memory of the behavioral intention by creating specific cues that remind individuals of their intention. They are effective because they allow individuals to delegate their behaviors toward the respective situation. Specifically, the implementation intention “is assumed to activate the mental representation of a specified situation and make it chronically accessible. Consistent with this assumption, implementation



intentions are found to enhance vigilance for relevant situational cues that are well remembered and easily detected” (Ajzen & Fishbein, 2005, p. 191). This process requires less conscious intent and thus makes behaviors more automatic (Bargh, 1996). Furthermore, it generates a sense of commitment that enhances the probability of individuals following through on their intentions (Braver, 1996).

As previously mentioned, at least compared to other domains such as exercise and physical activity there is a limited amount of research applying the reasoned action approach (Fishbein & Ajzen, 2010) in the sport context. As one of the exceptions Mammory and Winkel (1999) utilized the framework to explore 116 elite Canadian swimmers’ (58 female and 58 male) training adherence. The researchers assessed participants ( $M = 14.8$  years old,  $SD = 1.7$ ) attitude, subjective norm, perceived behavioral control, intentions, and training behaviors (i.e., attendance, volume, and coach assessment). Hierarchical regression analyses revealed that intentions were a statistically significant predictor for swimmers’ adherence to training ( $\beta = .37$ ,  $p < .001$ ). Specifically, intentions to complete the upcoming training cycle accounted for 14% of the variance in training frequency and 10% of the variance in the behavior reported by coaches. Mammory and Winkel (1999) suggested that the small proportion of the variance was likely due to instability of the intentions and the homogeneity of the training behavior in the particular study. Adding attitude, subjective norm, and perceived behavioral control to the regression model did not significantly improve its prediction and therefore offered support for the variables sequential nature as proposed by Fishbein and Ajzen (2010). Furthermore, Mammory and Winkel (1999) found that attitude ( $\beta = .19$ ,  $p < .001$ ), subjective norm ( $\beta = .15$ ,  $p < .001$ ), and perceived behavioral control ( $\beta = .54$ ,  $p < .001$ ) all significantly influenced athletes’ intentions accounting for 45% of the variance. Similar results were reported by Palmer, Burwitz, Dyer, and

Spray (2005) who found that attitude ( $\beta = .32, p < .05$ ), subjective norm ( $\beta = .29, p < .05$ ), perceived behavioral control ( $\beta = .22, p < .05$ ) had a significant influence on 163 female elite junior netball players' ( $M = 15.03$  years old,  $SD = 1.24$ ) intention to adhere to training, explaining 44% of the variance. In turn, intention significantly predicted adherence ( $\beta = .27, p < .05$ ) although the amount of variance was low ( $R^2 = 0.06$ ; Palmer et al., 2005).

Some researchers only found partial support for the reasoned action approach (Fishbein & Ajzen, 2010). For example, Theodorakis (1992) indicated that only perceived behavioral control ( $\beta = .24, p < .01$ ) significantly predicted 98 children's (52 boys and 46 girls;  $M = 11.1$ ,  $SD = .90$ ) intentions to participate in sport. Yet, in accordance with the reasoned action approach (Fishbein & Ajzen, 2010) these intentions significantly predicted participants' sport engagement ( $\beta = .44, p < .001$ ). Likewise, perceived behavioral control ( $\beta = .29, p < .05$ ) was found to be the only statistically significant predictor of 154 amateur volleyball players ( $M = 23.0$  years of age,  $SD = 6.7$ ) intention to play in games, which again significantly influenced their actual game attending behavior (i.e., how many games they played in;  $\beta = .27, p < .05$ ; Lu, Cheng, & Chen, 2013).

Evidence for the theoretical assumptions of the reasoned action approach (Fishbein & Ajzen, 2010) has also been demonstrated within the coaching and athletic training literature. Sagas, Cunningham, and Pastore (2006) surveyed 710 collegiate assistant coaches (466 women and 244 men) from NCAA Division I ( $n = 473$ ) and Division III ( $n = 237$ ) institutions to investigate their plans of becoming head coaches. More explicitly, Sages and colleagues (2006) measured participants' attitude, subjective norm, and perceived behavioral control to examine the variables ability to predict participants' intentions to seek head coaching jobs. They found that female assistant coaches' attitude ( $\beta = .45, p < .001$ ), subjective norm ( $\beta = .43, p < .001$ ),

perceived behavioral control ( $\beta = .11, p < .001$ ) significantly predicted their intentions accounting for 64.3% of the variance. Similarly, male assistant coaches' attitude ( $\beta = .41, p < .001$ ), subjective norm ( $\beta = .42, p < .001$ ), perceived behavioral control ( $\beta = .09, p < .001$ ) significantly predicted their intentions accounting for 56.9% of the variance. It was interesting that for all participants the influence of perceived behavioral control appeared to be smaller compared to attitude and subjective norm, which may provide support for the findings of Theodorakis (1992) and Lu et al. (2013).

Conatser, Naugle, Tillman, & Stopka (2009) assessed athletic trainers' ( $N = 120$ , 44 female and 76 male) beliefs toward working with Special Olympic athletes. They found that attitude ( $\beta = .373, p < .001$ ), subjective norm ( $\beta = .391, p < .001$ ), perceived behavioral control ( $\beta = .146, p < .001$ ) were statistically significant predictors of participants' intentions of working with a Special Olympian. These intentions significantly influenced actual behavior ( $\beta = .503, p < .001, R^2 = .253$ ). These results are supported by Rigby, Vela, and Houseman (2013) who found that athletic trainers' attitude and perceived behavioral control significantly predicted their intentions to follow concussion guidelines [ $F(3, 202) = 58.78, p = .001, R^2 = .47$ ], which predicted their actual behavior [ $F(2, 203) = 78.90, p = .001, R^2 = .44$ ].

Lastly, researchers have utilized elements of the reasoned action approach (Fishbein & Ajzen, 2010) to assess athletes' and coaches' intentions to seek sport psychology consulting services. For example, Anderson, Hodge, Lavalley, and Martin (2004) compared the usefulness of the TRA (Ajzen & Fishbein, 1980) and TBA (Ajzen, 1985) in terms of their ability to predict 112 athletes' (53 male and 59 female;  $M = 23.9, SD = 8.1$ ) intentions to work with a professional. While confidence in sport psychology consulting (i.e., attitude;  $\beta = .258, p < .01$ ) and subjective norm ( $\beta = .412, p < .01$ ) significantly predicted intentions in a hierarchical

regression [ $F(5, 106) = 13.70$ ;  $p < .01$ ] adding perceived behavioral control ( $\beta = .170$ ,  $p < .05$ ) significantly increased the amount of variance accounted for from 36.4% to 39.7% [ $F(6, 105) = 12.57$ ;  $p < .01$ ]. This indicated that including all three variables can potentially increase the predictive ability of such research.

### **Transtheoretical Model of Behavior Change**

While Fishbein and Ajzen (2010) reasoned action approach is primarily interested in understanding why people perform certain actions one framework that is focused on explaining when and how people are likely to change their behavior is the Transtheoretical Model of Behavior Change (TTM; Prochaska & DiClemente, 1983). Specifically, Prochaska and DiClemente (1983) initially developed their framework for the treatment of addictive behaviors and smoking in particular. Prochaska and DiClemente (1986) suggested that behavior change is a dynamic rather than an ‘all or nothing’ phenomenon. Thus, they argued that individuals progress through five stages based on their readiness to change: precontemplation (individuals have no intention of changing the behavior), contemplation (individuals are aware of a need to change their behavior and intend to take action within the next 6 months), preparation (individuals intend to take action within the next 30 days and make small changes in this direction), action (actual change occurs but for less than six months), maintenance (individuals maintain the new behavior for more than six months), and termination (individuals have no temptation to relapse; see Prochaska, Redding, & Evers, 2008). These stages of change form a simplex pattern as adjacent stages are more highly correlated with each other than with other stages (Prochaska & DiClemente, 1986).

This stage model entails that people begin with no intend to change because they are uninformed or have unsuccessfully tried changing their behavior in the past. They are typically

resistant and unmotivated for change (i.e., precontemplation). Then they start thinking about change and deliberate the pros and cons of behavior modification. However, they may be stuck in a balance between benefits and costs (i.e., contemplation). With a shift in this decisional balance as the perceived advantages increase and the perceived disadvantages decrease they begin to develop an intention to change their behavior. This is followed by making small steps toward the behavior change and developing a plan of action (i.e., preparation). Next, they make meaningful changes in their lifestyle and frequently engage in the new behavior (i.e., action). Nonetheless, change is not easy and thus people have to work to avoid relapse. Yet, they can gain confidence that they can maintain the behavior (i.e., maintenance). Finally, if they are successful they will have no temptation and feel completely capable of sustaining the behavior (i.e., termination; Prochaska et al., 2008).

It is acknowledged that stage progression is more cyclical rather than linear in nature as individuals progress and regress in their attempt to change behavior (Prochaska & DiClemente, 1986). Thus, the stages reflect the temporal dimension of behavior change. For example, in regards to smoking cessation there are four common patterns:

- (a) a linear profile in which individuals progress directly from one stage to the next; (b) the more common cyclical profile in which individuals begin to take action and then relapse, followed by further contemplation and action before substantial improvement is maintained; (c) an unsuccessful cyclical profile; and (d) a nonprogressing profile in which individuals remain stuck in a stage like precontemplation or contemplation, without improving over time (Prochaska & DiClemente, 1986, p. 13).

This dynamic process and the different patterns are primarily mediated by individuals' processes of change, self-efficacy, and decisional balance.

## **Processes of Change**

First, “a process of change represents a type of activity that is initiated or experienced by an individual in modifying affect, behavior, cognitions, or relationship (Prochaska & DiClemente, 1986, p. 7). In contrast to coping strategies these processes are limited in number and can be classified as either experiential or behavioral (Prochaska, Velicer, DiClemente, & Fava, 1988). Consciousness-raising (i.e., gaining knowledge to support the behavior change), social liberation (i.e., increasing other resources), self-reevaluation (i.e., evaluating one’s feelings and thoughts), environmental reevaluation (i.e., evaluating how behavior affects others), and dramatic relief (i.e., experiencing and expressing negative emotions) have been characterized as experiential processes. Simultaneously, self-liberation (i.e., taking action or believing in ability to change), counterconditioning (i.e., finding alternative behavior), stimulus control (i.e., removing reminders for the behavior), contingency management (i.e., self-rewarding change), and helping relationships (i.e., social support) embody behavioral processes of change (Prochaska & DiClemente, 1986). These processes are more prominent at particular stages of change with experiential processes being more important in the early and behavioral process in the later stages (Biddle & Nigg, 2000). This is of practical significance as knowing an individual’s current stage of change can help identify which processes to apply in order to help the person progress to the next stage (Prochaska & DiClemente, 1983).

## **Self-efficacy**

Second, similar to the reasoned action approach (Fishbein & Ajzen, 2010) the TTM (Prochaska & DiClemente, 1983) acknowledges the essential role of self-efficacy (Bandura, 1977) in predicting changes in behavior and thus progression through the stages. This embodies individuals’ confidence to engage in the new behavior across a variety of challenging situations

(Prochaska et al., 2008). Additionally, DiClemente (1981) found that this variable was in direct contrast to individuals' temptation level, which is most commonly reflected as negative affect, emotional distress, positive social situations, and craving. Temptation is a unique variable within this model that has been developed to understand change in addictive behaviors.

### **Decisional Balance**

Third, decisional balance, which is the systematic evaluation of the advantages and disadvantages of a behavior, meaningfully influences behavior change (Prochaska & DiClemente, 1986). Decisional balance can represent gains and losses both for the individual as well as for significant others and can affect behavior change through alterations in cognition and motivation (Velicer, DiClemente, Prochaska, & Brandenburg, 1985). When individuals experience a shift in this decisional balance and the cost of behavior change no longer outweigh the benefits they begin to move beyond contemplation. More specifically, they typically enter the preparation stage and seriously plan change when potential benefits are in balance with potential losses (Buxton, Wyse, & Mercer, 1996).

The processes of change, self-efficacy, and decisional balance can be utilized to predict progress from one stage of change to the next (Prochaska & DiClemente, 1983). While this relationship has received limited attention in the sport environment there is ample evidence related to health, exercise, and physical activity behaviors. For example, individuals' confidence in the ability to perform a behavior has been found to increase exercise behavior (e.g., Marcus, Eaton, Rossi, & Harlow, 1994; Marcus, Shelby, Niaura, & Rossi, 1992; Nigg & Courneya, 1998). Similarly, the evaluation of pros and cons affected individuals' decision making for exercise (Marcus, Rakowski, & Rossi, 1992). Specifically, in their meta-analytic review Marshall and Biddle (2001) found that "progression from precontemplation to action involves an

approximate increase in pros of 1.3 SD and an approximate decrease in cons of 1.2 SD” (p. 242). Furthermore, experiential processes are typically most frequently utilized during the action phase and behavioral process during maintenance (Marshall & Biddle, 2001). In addition, there is initial indication that the termination stage may not be relevant for the exercise domain (Courneya & Bobick, 2000a).

Nevertheless, comparable to the reasoned action approach (Fishbein & Ajzen, 2010) empirical evidence for the applicability of the TTM (Prochaska & DiClemente, 1983) within the sport context is rather limited compared to other areas (e.g., addictive behaviors). Nevertheless, Clement (2008) used the framework to explore 70 National Collegiate Athletic Association (NCAA) Division I athletes’ (31 females and 39 males) adherence to injury rehabilitation. One-way Analysis of Variance revealed that individuals in the preparation stage had statistically higher self-efficacy [ $F(2, 67) = 25.32; p = .01$ ], indicated more pros [ $F(2, 67) = 17.89; p = .01$ ] and less cons [ $F(2, 67) = 10.67; p = .01$ ], and utilized more behavioral change processes [ $F(2, 67) = 10.34; p = .01$ ] and less experiential change processes [ $F(2, 67) = 19.09; p = .01$ ] than those in the precontemplation/contemplation stage. Similar patterns emerged for a comparison between participants in the preparation and action stage although none of these results were statistically significant. In addition, there was no statistically significant difference in regard to compliance and adherence based on athletes’ stage of change. However, Clement (2008) argued that this finding was likely due to the positive relationships between athletes and athletic trainers in the study which resulted in limited variability as most participants attended rehabilitation regularly.



### **Health Belief Model**

As an additional theory to explain behavior and behavior change the Health Belief Model (HBM; Champion & Skinner, 2008) was initially developed by Rosenstock, Hochbaum, Kegeles, and Leventhal at the U.S. Public Health Service to better understand the widespread failure of screening programs for tuberculosis. The framework has since been frequently employed to explain change and maintenance of various health-related behaviors. The HBM (Champion & Skinner, 2008) suggests that individuals will engage in a behavior depending on several factors, which include perceived susceptibility (i.e., perceived likelihood of experiencing negative health outcome), perceived severity (i.e., feelings about the seriousness of negative health outcome), perceived benefits (i.e., belief in efficacy of the target behavior in reducing risk or seriousness of negative health outcome), perceived barriers (i.e., belief about tangible and psychological costs of target behavior), cues to action (i.e., strategies to activate readiness), and self-efficacy (i.e., confidence in ability to take action; Champion & Skinner, 2008). These constructs form individuals' beliefs and their combination leads to behavior. These beliefs are further influenced by other demographic (e.g., level of education), social-psychological (e.g., opinion of others), and structural variables (e.g., communication and information). The HBM's (Champion & Skinner, 2008) performance has been supported by substantial empirical evidence (see Janz & Becker, 1984).

### **Comparison between Models of Behavior Change**

While the TRA (Ajzen & Fishbein, 1980), TPB (Ajzen, 1985), TTM (Prochaska & DiClemente, 1983), and HBM (Champion & Skinner, 2008) have unique characteristics and contain some contrasting variables to explain behavior change there are also multiple similarities. All frameworks incorporate individuals' evaluations about the target behavior. This

process is understood as attitude in the reasoned action approach (Fishbein & Ajzen, 2010), decisional balance in the TTM (Prochaska & DiClemente, 1983), and perceived susceptibility, severity, benefits, and barriers in the HBM (Champion & Skinner, 2008). Thus, there seems to be a consensus that in order for people to engage in a behavior they need to first evaluate the target action positively. In contrast to attitudes decisional balance cannot be considered as a unitary dimension (i.e., with two polar opposites). Advantages and disadvantages are rather defined as independent constructs (i.e., orthogonal; Prochaska & DiClemente, 1986). Additionally, “In the TTM the pros and cons are not weighted in an expectancy-value formula, as they are in the TPB, but rather operationalized only in terms of value” (Courneya & Bobick, 2000b). Since attitude can be measured at different levels of specificity they appear to provide a more comprehensive summary of individuals’ beliefs in regards to a behavior (Courneya & Bobick, 2000b).

Furthermore, all theories recognize that it is not only individuals’ evaluation of the behavior but also their perceived self-efficacy (Bandura, 1977) to perform it successfully that meaningfully determines their engagement. However, there are also conceptual difference as the reasoned action approach (Fishbein & Ajzen, 2010) appears to be the only framework to include variables regarding social influences (i.e., normative beliefs and perceived norm). Such social influences have been shown to be a meaningful determinant of exercise behavior (Chogaahara, Cousins, & Wankel, 1998). The reasoned action approach (Fishbein & Ajzen, 2010) further includes intention strength as an immediate predictor of behavior which appears to be the best summary measure of motivation and commitment (Courneya & Bobick, 2000b).

In a more comprehensive comparison and attempted incorporation of the TPB (Ajzen, 1985) and TTM (Prochaska & DiClemente, 1983) Courneya and Bobick (2000b) suggested that individuals’ progression through the stages of change was influenced by TPB constructs. They

examined 427 undergraduate students' ( $M = 19.7$  years old;  $SD = 4.0$ ) exercise behavior and found that attitude, subjective norm, and perceived behavioral control mediated the relationships between the processes of change and the stages of change. Furthermore, these constructs also moderately mediated the relationship between the processes of change and intention. In turn, intention was an important discriminator between the first three states of change. Yet, this variable did not predict differences between individuals in the action and maintenance stage. Courneya and Bobick (2000b) suggested that "this finding makes sense given that the transition from action to maintenance concerns the length of time performing exercise, not the intention or the amount of exercise being performed" (p. 54). This result was in contrast to the longitudinal study by Courneya, Plotnikoff, Hotz, and Birkett (2001) who found that intention predicted individuals' transition between all stages. Finally, the processes of change explained 46% of the variance in attitude, 23% of the variance in subjective norm, and 22% of the variance in perceived behavior control (Courneya & Bobick, 2000b). These findings further supported the notion that there are conceptual relationships between the TPB (Ajzen, 1985) and the TTM (Prochaska & DiClemente, 1983).

### **Application to Coaching and Coach Education**

As previously indicated, coaches' behaviors (i.e., autonomy-supportive behaviors, structure, and involvement) have a meaningful influence on athletes' motivation and overall sport experience (Mageau & Vallerand, 2003). However, it appears that instead of nurturing an autonomy-supportive climate some coaches continue to employ a more controlling interpersonal style (Mageau & Vallerand, 2003). Thus, there appears to be a need to change or more explicitly improve coaching behaviors toward more autonomy-supportive leadership. In this endeavor it becomes essential to explore variables that can affect the likelihood of behavioral modifications.

Only by gaining an in-depth understanding of these antecedents of behavior is it possible to make an impact at the foundational level and therefore cause adjustment in behavior that can be sustained over time (Fishbein & Ajzen, 2010; Prochaska, & DiClemente, 1983).

There are multiple theoretical frameworks that have been employed to explain behavior change. While all frameworks are supported by ample evidence and provide valuable information it appears that the TTM (Prochaska & DiClemente, 1983) offers an understanding of how (i.e., processes of change) and when (i.e., stages of change) people change their behavior while the reasoned action approach (Fishbein & Ajzen, 2010) denotes why they engage in the behavior (Courneya & Bobick, 2000b). The HBM (Champion & Skinner, 2008) appears to be too conceptually connected to health behaviors to utilize it for an exploration of coaching behaviors. Overall, the reasoned action approach (Fishbein & Ajzen, 2010) likely offers an ideal lens when trying to understand the antecedents of behavior (i.e., the why). As described before, Fishbein and Ajzen (2010) suggest that the stronger individuals' intentions are the more likely it is that they will actually engage in the behavior. This relationship has been supported by evidence within the context of athletics (Conatser et al., 2009; Lu et al., 2013; Mammory & Winkel, 1999; Palmer et al., 2005; Theodorakis, 1992). Furthermore, Fishbein and Ajzen (2010) proposed that people's intentions are determined by their attitude, perceived behavioral control, and perceived norm toward the respective behavior. Again, there is empirical evidence for this influence within the sport environment as attitude, perceived behavioral control, and perceived norm significantly predicted athletes' (Anderson et al., 2004; Mammory & Winkel, 1999; Palmer et al., 2005), coaches' (Anderson et al., 2004; Sagas et al., 2006) and athletic trainers' (Conatser et al., 2009; Rigby et al., 2013) intentions to engage in various behaviors.

Besides the ability to provide insight into the motives for behavior the reasoned action approach (Fishbein & Ajzen, 2010) also offers an ideal framework for such an exploration in the context of coaching because, despite the names suggesting otherwise, it does not submit that people are always rational in their decisions or deliberate behavior at length. It rather proposes that “once a set of beliefs is formed it provides the cognitive foundation from which attitude, perception of control, and perceived norm – and ultimately intentions and behaviors – are assumed to follow in a reasonable and consistent fashion” (Fishbein & Ajzen, 2010, p. 24). This approach appears to be particularly helpful when exploring coaching, which can be characterized as structured improvisation guided by experience (Cushion, Armour, & Jones, 2003). Thus, “the implications for coach education lie in understanding how knowledge and experience are passed on and become translated into the coaching process” (Cushion et al., 2003, p. 223). This translation process seems to align better with the assessment of perceptions toward a behavior rather than behavior the behavior in itself. Furthermore, “through the habitus, coaches’ behaviors and actions are often the expression of tacit beliefs that are so taken for granted that they cannot be recognized or verbalized” (Cushion et al., 2003, p. 223). An investigation of reasoned action approach variables (i.e., attitude, perceived behavioral control, and perceived norm) may offer some valuable insight into this habitus.

Accordingly, measuring coaches’ evaluation of autonomy supportive-behaviors, structure, and involvement as well as their perceived ability and pressure from significant others to engage in the behaviors can provide a more in-depth understanding of their intentions to adapt a more autonomy-supportive coaching style. Since these intentions will ultimately influence actual behaviors (e.g., Armitage & Conner, 2001; Godin & Kok, 1996; Hagger et al., 2002) such data can offer valuable information about the antecedents of coaches’ behavior. Having this

foundational knowledge can help to develop educational programs and interventions aimed at nurturing autonomy-supportive coaching styles. Specifically, being aware of coaches' attitude, perceived behavioral control, and perceived norm allows researchers, sport psychology professionals, and coach educators to tailor their approach toward the specific variables that seem to require particular attention and improvement for the individuals they work with.

Recently, there has been a substantial growth in the provision of and importance attached to coach education in many Western countries (Gilbert & Trudel, 1999a). This process entails an overall attempt to develop effective leadership and coaching which has been defined as, “the consistent application of integrated professional, interpersonal, and intrapersonal knowledge to improve athletes' competence, confidence, connection, and character in specific coaching contexts” (Cote & Gilbert, 2009, p. 316). There is undeniable value to such programs in an effort to improve coaching (Woodman, 1993) and coaches appear to be extremely interested in coaching education (Gould, Giannini, Krane, & Hodge, 1990), especially when the material appears relevant (Vargas-Tonsing, 2007). Yet, Gilbert and Trudel (1999b) have suggested that the “evaluation of coach education programs has become one of the most pressing issues in sport science research” (p. 235). This similarly holds evident for coaching interventions. Explicitly, it does not appear to be enough to teach coaches about autonomy support, structure, and involvement if they do not end up using these behaviors.

Educational programs and interventions for coaches are typically designed to change behaviors, which can be directly measured based on a dichotomous tendency (i.e., individual did or did not engage in the behavior), magnitude (i.e., the amount), or frequency (i.e., how often; Fishbein & Ajzen, 2010). However, it is unfortunately not possible to assess potential changes immediately following the program as coaches have not yet interacted with their athletes. Hence,

there no immediate feedback is available for researchers, sport psychology professionals, and coach educators. This makes it difficult to adequately evaluate educational programs and interventions in an attempt to enhance their effectiveness; especially since coaches may not be available for follow-up assessments. However, behavioral antecedents (i.e., attitude, perceived behavioral control, and perceived norm) can be measured pre and post intervention to indicate potential changes in coaches' future behavior.

In sum, the advantage to assessing attitude, perceived behavioral control, and perceived norm in an effort to enhance coaches' use of autonomy-supportive behaviors, structure, and involvement is three-fold. First, gaining knowledge about how coaches evaluate these behaviors a-priori can inform the content of educational programs and interventions. Researchers, sport psychology professionals, and coach educators can utilize the knowledge to develop a more targeted and specific approach. Second, assessing reasoned action approach variables (Fishbein & Ajzen, 2010) after educational programs and interventions can also help evaluate their effectiveness (i.e., did the intervention successfully change participants' attitudes, perceived behavioral control, and perceived norm?). This helps to make improvements in the design and delivery and thus enhance its future effectiveness. Third, coaching appears to be largely competency based and helping coaches to reflect on their practices or understand why they coach as they do can be a meaningful catalyst for change (Cushion et al., 2003). "Unless coaches reflect on and reinterpret past experiences of coaching, they remain in danger of leaving their practice untouched by new knowledge and insight" (Cushion et al., 2003, p. 224). Therefore, when the objective is not only to assess whether coaches engage in the behavior or not but to understand why they may or may not do so it is essential to first understand their evaluations of these behaviors.

### **Conceptualization of the Self**

Assessing coaches' attitudes, perceived behavioral control, and perceived norm towards autonomy-supportive behaviors, structure, and involvement in practice, can be meaningfully enhanced through a more in-depth understanding of the self-concept. When trying to explore beliefs that are associated with behavior change, it is essential to understand what these beliefs are based on. Specifically, self-perceptions can influence beliefs. Mageau and Vallerand (2003) proposed three main determinants for coaches' use of autonomy-supportive behaviors. Explicitly, coaches' personal orientation, coaching context, and perceptions of athletes' behavior and motivation regulate whether they employ an autonomy-supportive approach when working with athletes. Therefore, just as there are autonomy-supportive and controlling coaching interpersonal behaviors, this dichotomy can also be found at the personality level (Mageau & Vallerand, 2003). Individuals with an autonomy-supportive orientation generally respect and value subordinates' (e.g., athletes) need for autonomy (Reeve et al., 1999) and, thus, employ more autonomy support in their work (Pelletier et al., 2001). Consequently, how coaches evaluate and perceive themselves can meaningfully affect their beliefs about their behavior. The importance of the self, and, in particular, individuals' understanding of their self-concept as a major determinant of human behavior has long been recognized by researchers within psychology (Allport, 1937; James, 1890; Maslow, 1954; Mead, 1934). This interest may particularly be due to the fact that positive self-perceptions have been proposed to be a meaningful antecedent to adaptive functioning (e.g., independence, responsibility, tolerance, confidence, social support; Emler, 2001).

However, when trying to conceptualize the self, there is typically a certain amount of intangible elusiveness as it is difficult to actually articulate understanding of what exactly the self



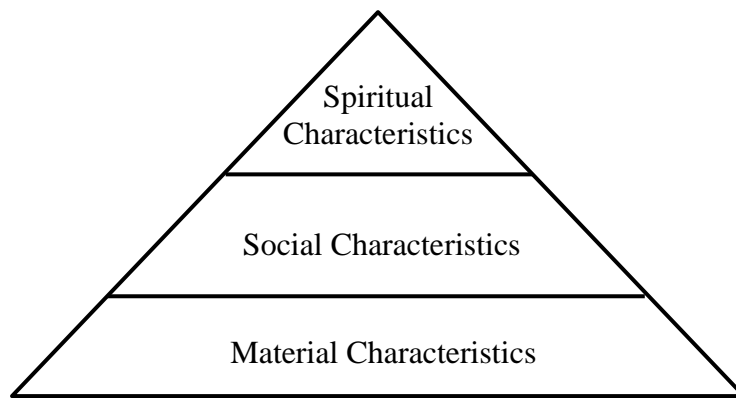
is (Baumeister, 1999). This becomes evident when looking at the varying terminology within the literature. The lack of theoretical distinction has led to terms frequently being used interchangeably (e.g., self-image and self-esteem; Hughes, 1984) and the creation of ill-defined labels such as self-worth, self-belief, self-concept, self-awareness and self-regard (McGuire, 1994). Harter (1983) argued this resulted in most terms used to describe the self being simplistic prefixes rather than legitimate constructs. More explicitly, while there are a plethora of definitions, there appears to be little agreement (Butler & Gasson, 2005). At least in parts, the general lack of conceptual clarity regarding the self-concept (Baumeister, 1999) likely stems from the multitude of theoretical frameworks, models, and instruments that have been developed to explore the construct and the subsequent debate about their validity. Various researchers have constructed (at times) contrasting theories aimed at explaining the understanding of the self (for a more thorough review, please refer to Harter, 2012). In addition, the self and self-concept should not automatically be considered as the same. “As psychologists, the argument goes, our best choice is to study this cognitive representation (the self-concept) and dispense with the invented (or, at any rate, the redundant) referent (the self)” (Damon & Hart, 1998, p. 3).

### **James’ Foundational Self Theory**

When exploring theories aimed to provide an understanding of the self it becomes evident that a large number of frameworks are based on James’ (1892) foundational work, in which he hypothesized the differentiation between the I-self and Me-self. The Me-self can be considered the objective component of the self (i.e., the way people present themselves) and includes certain constituents that define the self-as-known, such as “all the material characteristics (body, possessions), all the social characteristics (relations, roles, personality), and all the ‘spiritual’ characteristics (consciousness, thoughts, psychological mechanisms) that

identify the self as a unique configuration of personal attributes” (Damon & Hart, 1998, p. 5).

James (1961) suggested that these constituents are organized into a hierarchical structure with material characteristics at the bottom, spiritual considerations at the top, and the factors affecting social interactions in-between.



*Figure 1. Hierarchical Structure of the Me-Self*

In contrast:

The essence of the ‘I’ is its subjectivity. This translates into an awareness of several core features of individuality, among which are: (1) an awareness of one’s agency over life events; (2) an awareness of the uniqueness of one’s life experience; (3) an awareness of one’s personal continuity; and (4) an awareness of one’s own awareness (Damon & Hart, 1998, p. 6).

This awareness translates into individuals’ interactions and determines the meaning of life experiences, as it influences interpretations of every situation, context, and environment.

Furthermore, it even provides a reflection on the person in itself (Damon & Hart, 1998). In sum,

the I-self “is that which at any given moment is conscious, whereas the Me is only one of the things which it is conscious of” (Baumeister, 1999, p. 74). That is, the I-self represents the individual (i.e., the actor or knower) and the Me-self is the object of that person’s knowledge. More specifically, the Me-self is an aggregate of objective knowledge as evaluated by the I-self (Harter, 2012).

### **Self-esteem**

Despite the lack of conceptual agreement regarding the self-concept there appear to be evident themes within the literature. For example, self-esteem, which has often been described as an attitude toward oneself (Coopersmith, 1967; Rosenberg, 1965) has received significant attention as a meaningful constituent of individuals’ conceptualization of the self. As is the case for all attitudes self-esteem has cognitive and affective components. However, it appears that not all cognitions are evaluatively laden or influence people’s self-esteem; there can be a variety of self-beliefs without affective quality (Leary, Tambor, Terdal, & Downs, 1999). There are two different conceptualizations of global self-esteem. According to James (1892) self-esteem is cognitive centered in that personal success is based on perceived accomplishments. When perceived success is congruent with individuals’ aspirations then people will experience high self-esteem. Hence, self-esteem stems from individuals’ personal accomplishment and is an essential component of the Me-self. More explicitly, James’ (1982, 1961) considered self-esteem to be a ratio of success to pretention:

$$\text{Self – esteem} = \frac{\text{Success}}{\text{Pretentions}}$$

This comparison between competence and aspirations plays an important role in how individuals evaluate themselves. In contrast, Cooley (1902) proposed a ‘looking-glass-self’ in that self-esteem is determined by the internalization of significant others’ opinions. Overall, there appears

to be a distinction between the self-concept (i.e., beliefs about the self) and self-esteem (i.e., evaluation of oneself in light of those beliefs). Leary and colleagues (1999) suggested that people generally have the desire to feel good about themselves in the present moment as well as across time and contexts. Therefore, there is an almost axiomatic need to protect and enhance self-esteem (Rosenberg, 1979). As a consequence, individuals are highly selective about the domains they use to determine their self-worth. James (1890) concluded that “our self-feeling in this world depends entirely on what we back ourselves to be and do” (p. 45). For example, for some such evaluations may be based on their athletic involvement while for others on their academic pursuits. Thus, people differ in the domains and contingencies they must satisfy to achieve high global self-esteem. In general, having weaknesses takes its toll on global self-esteem.

It should also be noted that in addition to specific evaluations there is also a more average or overall perception of the self that is independent of objective accomplishments (James, 1892). This was supported by Cooley (1902) who advocated that individuals can have a balanced self-respect which cannot be altered meaningfully by external influences. In this context, Rosenberg (1979) argued that both the general and specific characteristics exist as distinctive constructs and should be studied accordingly. In sum, it appears that this distinction between general and specific evaluations is justified and both contribute to individuals’ self-esteem.

Initially many researchers interested in the self and self-esteem focused on self-image disparity; more specifically, researchers highlighted the disparity between individuals’ current view of the self (i.e., real self) and the ideal person that they would like to be (i.e., ideal self; Rogers, 1951). This congruence determines the self-image and is related to personal and social adjustment. However, researchers have concluded that:

Higher levels of development imply greater degrees of cognitive differentiation. In any cognition, therefore, the more highly developed person should tend to employ more categories and finer distinctions within each category than should a person of lower development. This greater differentiation should result in a greater likelihood for disparity between an individual's conceptualization of the real self and the ideal self. It is important here to recognize that the self-images are symbolic conceptual constructions and as such are particularly amenable to cognitive analysis (Glick & Zigler, 1985, p. 2).

With this quote Glick and Zigler (1985) illustrated that there is likely a developmental component to the self-concept. This approach to the interpretation of self-image disparity has been supported by considerable empirical evidence (see Glick & Zigler, 1985). Thus, rather than ominous self-disparity may simply be a concomitant of maturity and development (Glick & Zigler, 1985).

**Role of self-esteem.** There are different views on the underlying role of self-esteem. Greenberg and colleagues (1992) suggested that knowledge of death is the most fundamental threat in human life and thus the central foundation for individuals' motivation. Self-esteem acts as defense mechanism against that threat. Explicitly, high self-esteem can reduce the anxiety that human beings perceive when confronted with the fact that they will die. In contrast, Leary and colleagues (1999) argued that it is the inherent human need to belong (i.e., form and maintain close social relationships) that lies at the core of self-esteem. Self-esteem is the inner monitor for how well this basic need is satisfied. There is correlational evidence for this notion (around -.50 across multiple studies) with anxiety being related to social rejection and exclusion, whereas the findings showed no correlation with death anxiety (Leary & Kowalski, 1995; Leary, Saltzman, &

Bednarski, 1995). Thus, it appears likely that high self-esteem means that individuals learned to cope with loneliness and social rejection rather than the threat of death (Baumeister, 1999).

In addition, perhaps of particular interest to an exploration within the sport environment is the fact that there seems to be a strong connection between individuals' perception of their physical appearance and their self-esteem. As Harter (2012) proposed "one domain consistently and robustly heads the list, namely, perceived physical appearance, leading us to ponder whether self-esteem is literally only skin-deep" (p. 158). There is ample evidence within the literature (see Harter, 2012) that submits that the inner self (i.e., one's global self-esteem) is highly correlated with an evaluation of the outer self (i.e., perceptions of one's physical appearance, attractiveness, or body image). Specifically, individuals who evaluated their appearance positively reported higher levels of global self-esteem compared to those who had a negative perception of their appearance. In an attempt to explain this relationship Harter (2012) suggested that there is likely a qualitative difference in the domain of physical appearance. Furthermore, as Leary and colleagues (1999) indicated that self-esteem is determined by people's desire to be included by other people. Appearance appears to be a domain that is particularly available for such evaluation as it is "an omnipresent feature of the self, it is always on display for others, or for the self, to observe, scrutinize, and judge. We gaze at ourselves in real mirrors and we anticipate the evaluations of others, as social mirrors" (Harter, 2012, p. 159). In contrast, other domains, such as athletics, academics, social interactions, and behavioral conduct are not constantly on display for this scrutiny. Thus, individuals appear to have more control over if and when their competency in these areas is on display.

Regardless how individuals cultivate their perceptions there is ample evidence in the literature to support the importance of fostering high self-esteem (see Baumeister, 1999). In

general this might be due to the fact that persons with low self-esteem lack a clear, stable, consistent understanding of themselves. Consequently, it can be argued that “low self-esteem is, thus, not a firm conviction that the self is worthless or despicable. It is rather simply the lack of a clear idea that the self is worthy and wonderful” (Baumeister, 1999, p. 219).

### **Self-esteem in Sport**

Sport participation is one element that contributes to the development of individuals' thinking about themselves. Athletes appear to use their sport involvement to construct positive confirmations. Researchers have also found that collegiate athletes have higher self-esteem compared to other university students (Armstrong & Oomen-Early, 2009). For example, Marsh and Jackson (1986) found that female athletes evaluated their physical competence higher compared to female non-athletes, which nurtured higher levels of self-worth. Daniels and Leaper (2006) suggested that the positive influence of sport participation on self-esteem might be domain-specific. They further highlighted that peer acceptance mediated this relationship. Finally, since physical appearance appears to be a meaningful antecedent to self-esteem (for a review, see Fredrickson & Roberts, 1997) the evaluation of someone's body can likely vary depending on the circumstances. For example, appraisals in sport may be significantly different than in other domains. Somebody who has an athletic body may perceive that as positive when in the sport environment but may not evaluate it as positively outside this setting as there may be other societal standards. Thus, for athletes self-esteem can be determined by appraisals of the person as a whole, in a variety of domains, or explicitly as an athlete.

### **Trait versus State Conceptualization**

The concept of domain-specific self-esteem appears noteworthy given the general distinction between the trait and state self-concept. Similar to other psychological constructs

(e.g., anxiety) this difference indicates whether the self-concept should be considered as something inherent and stable (i.e., trait) or rather as a situation and context specific concept that can develop and change over time (i.e., state). Campbell (1990) elegantly summarized this discrepancy:

The self is explicitly viewed here as having both an evaluative and a knowledge component. I conceptualize the evaluative component as trait self-esteem, a global self-reflexive attitude addressing how one feels about the self when it is viewed as an object of evaluation. This conceptualization does not deny the fact that feelings of self-worth can vary over time and roles, and that different roles are differentially important in affecting self-regard. However, it is important to distinguish (a) outer self-esteem or self-evaluation – temporary feelings of self-regard that vary over situations, roles, feedback, events, and the reflected appraisals of others– from (b) inner or trait self-esteem – a global personal judgement of worthiness that appears to form relatively early in the course of development, remains fairly constant over time, and is resistant to change (p. 225).

In an attempt to distinguish between the importance of the state and trait approach some researchers have suggested that individuals differ not in what their self-esteem is based on but rather on whether their self-esteem is contingent or noncontingent (Deci & Ryan, 1995; Kernis, 2003). Deci and Ryan (1995) proposed that self-esteem can be either contingent or “true.” In this context, individuals’ true self-esteem emerges naturally from autonomous, efficacious action in the context of supportive, authentic relationships. Kernis (2003) argued that noncontingent self-esteem is optimal and contingent self-esteem suboptimal.



Researchers have found multiple factors that might influence the trait self-concept. For example, self-esteem can be based on individuals' specific competencies and abilities in various domains and situations (e.g., academics; Coopersmith, 1967; Rosenberg, 1979). Others might base their self-esteem of the competition with others; this appears to be particularly evident for men (Cross & Madson, 1997; Josephs, Markus, & Tafarodi, 1992). Furthermore, as self-perceptions are frequently influenced by the evaluation of others (Coopersmith, 1967) there is a multitude of agents that potentially play an important role that can vary across situations and environments.

**Gender and ethnicity self-concept considerations.** In addition to interactional considerations, researchers have also found difference in self-perceptions based on gender and ethnicity which would suggest trait differences. Josephs et al. (1992) argued that the self-esteem of men is primarily derived from their ability to be independent and outperform others. In contrast, women mainly base their self-esteem of being connected and interdependent with others (Josephs et al., 1992). In addition, there appear to also be difference based on race and ethnicity. For example, Black Americans' self-esteem appears to be more contingent on religiosity compared to White Americans (Blaine & Crocker, 1995; St. George & McNamara, 1984). Furthermore, compared with White Americans Black Americans' self-esteem may be less contingent on the approval and regard from others (Crocker & Lawrence, 1999). Finally, it has been suggested that Black students are less likely than other students to base their self-esteem on their academic performance (Osborne, 1995; Steele, 1997).

### **Self-esteem Measures**

While theoretical frameworks and models undeniably built the foundation for understanding the self (e.g., self-esteem) a comprehensive exploration of the construct ultimately

requires an investigation of individuals' perspectives. Hence, it becomes necessary to measure self-esteem. When reviewing the current literature it becomes evident that there is a large range of instruments constructed to assess this construct. For example, Blascovitch and Tomaka (1991) suggested that at least 200 measures of self-esteem have been created. In their comprehensive review of the self-concept and its assessment Butler and Gasson (2005) found 1426 articles referring to a measurement of the self for children and adolescents alone. Thus, in addition to limited transparency within theoretical frameworks and models there appears to be a lack of conceptual clarity regarding measurement as well.

The Self Concept Scale (SCS; Piers, 1969) consists of 80 items, which has been narrowed to 60 items in its most recent version. The scale regards self-concept as synonymous with self-esteem and has been developed for children. Specifically, Piers (1984) characterizes the self-concept as a relatively stable representation of self-attitudes that describe and evaluate individuals' behavior and attitudes. These attitudes are assessed using first person declarative statements (e.g., "I have nice hair" or "I am dumb about most things") that individuals respond to positively (i.e., yes) or negatively (i.e., no).

The Self Esteem Scale (SES; Rosenberg, 1965) assesses self-esteem as the sum of individuals' cognitions and affections in reference to themselves as an object. Thus, the instrument measures individuals' judgements about their feelings of self-worth, and the self, as a whole. The scale utilizes 10 first person evaluative statements (5 positive and 5 negative; e.g., "at times I think I am no good at all" or "I wish I could have more respect for myself") that are rated on a 4-point Likert scale (i.e., from "Strongly agree" to "Strongly disagree").

The Tennessee Self Concept Scale (TSCS; Fitts, 1965) was developed based on self-descriptive generated from participants (i.e., their own perceptions about themselves), which

were subsequently categorized by clinical psychologists. The original scale (Fitts, 1965) has undergone multiple revisions (Roid & Fitts, 1988; Fitts & Warren, 1996) and in its current version comprises two scales (i.e., inconsistent responding and academic/work). The adult form entails 82 items with a short version of 20 items, which consist of positive (e.g., “I am a nobody”) and negative (e.g., “I feel good most of the time”) self-descriptive statements evaluated with a 5-point response format (i.e., “always false” to “always true”).

The Self Esteem Inventory (SEI; Coopersmith, 1967) assesses both attitudinal and evaluative aspects of the self as competent, successful, significant, or worthy. It evaluates self-esteem across four contexts but is regarded as a uni-dimensional measure. The instrument consists of 50 positive and negative self-descriptive statements (e.g., “my parents expect too much of me” or “kids pick on me very often”) with individuals rating their correspondence to each item as either “Like me” or “Unlike me.”

Self Image Profiles (SIP-C; SIP-A; Butler, 2001) focus on the distinction between the most frequently utilized self-evaluations (i.e., self-esteem) and the descriptive aspect of the self (i.e., self-image). Thus, individuals are asked to indicate both how they consider themselves to be (i.e., self-image) and how they would like to be on 25 positive and negative items. Self-esteem can be assessed as the discrepancy between the two ratings.

**Critique of self-esteem measures.** In general, there appear fundamental principles across all instruments attempting to assess the self-construct and self-esteem in particular; these main philosophies simultaneously highlight some of the potential issues of this endeavor. One predominant dispute has been the difficulty to objectively assess self-concepts. Hypothetical constructs like self-esteem cannot be operationalized as observable behaviors. Therefore, researchers typically utilize self-reports as the self-concept appears to be both a

phenomenological process (i.e., the individuals become aware of how they are judged by others) and reflexive process (i.e., individuals perceive their own characteristics; Butler & Gasson, 2005). However, such self-reports are not free of issues as they necessitate the competence to verbalize perceptions and sufficient self-awareness. Both elements are potentially influenced by individuals' affective and motivational states as well as their development, which can shift from specific, behavioral and physical aspects to general abstract psychological characteristics (Butler & Gasson, 2005). Furthermore, when people are asked to judge their own characteristics, they typically tend to do evaluate themselves as better than the average person. "The authenticity of the self can also be compromised by the tendencies to inflate, becloud, and distort the real inner self, in seeking social approval and its presumed gains" (Harter, 2012, p. 329). This is referred to as the better-than-average effect and can be observed in almost any dimension (Alicke, Klotz, Breitenbecher, Yurak, & Vredenburg, 1995). In addition, when asked to self-report individuals tend to primarily reference the Me-self, which is the objective (i.e., outside) perspective of themselves. James (1961) suggested that the assessment of the I-self is best left to philosophy as it is difficult to quantify. Thus, most measures appear to evaluate an incomplete picture of the self-concept (Butler & Gasson, 2005).

When specifically evaluating the previously mentioned instruments it becomes evident that these scales appear to assess varying facets of self-functioning: a general notion of self-worth (SES, Rosenberg, 1965; MSCS), an evaluation of self-esteem (SCS, Piers, 1969; SEI, Coopersmith, 1967; TSCS, Fitts, 1965; SIP, Butler, 2001), and an evaluation of self-image (SIP, Butler, 2001). This further highlights the lack of conceptual clarity regarding the self-concept. Overall, most scales, perhaps with the exception of the TSCS (Fitts, 1965) seem to utilize items that are mainly researcher generate. It appears that this should at least cautiously be considered

problematic as researchers frequently failed to provide adequate rationales in the process (Butler & Gasson, 2005).

In regard to current instruments' utilization in the sport environment, while it may be possible to modify the items to represent sport-specific perceptions this would have to be validated by additional research. However, the most fundamental issue appears to be that these instruments were mainly conceptualized to assess the global self-concept. Therefore, it is questionable whether they can adequately capture the unique situational and contextual factors that compromise the athletic context.

### **Self-Competence**

Harter (2012) defined the self as “how one consciously reflects upon and evaluates one’s characteristics in a manner that he/she can verbalize” (p. 22). Thus, at the most general level she characterized the self as self-representations about how one describes oneself. This description changes as part of individuals’ developmental process. Therefore, there is no singular definition of the self-concept. According to Harter (2012):

Both the structure and the content of the Me-self at any given developmental level necessarily depend upon particular I-self capabilities, namely, those age-related cognitive processes that define the knower. Cognitive-developmental changes in I-self processes, therefore, will directly influence the nature of the self-theory at each substage” (p. 16).

This progression indicates that the self is evaluative in nature and is characterized as the way the I-self (i.e., the evaluator) becomes aware of and perceives the Me-self. In this process “cognitive determinants illuminate normative developmental features of self-development” (Harter, 2012, p. 1) and therefore “the construction of the self is inevitable... as our species has been designed to actively create theories about our world, including the construction of a theory of self in order to

make meaning of our experiences” (Harter, 2012, p.1). Accordingly, individuals’ self-perceptions are not just based on descriptive attitudes but also on more critical evaluations about their adequacy. These evaluations can differ based on the particular domain that individuals find themselves in. Hence, self-esteem not only entails valuing personal strengths and accomplishments, but also discounting the importance of weaknesses and failures. Such discounting functions as a self-serving mechanism in which people protect their self-concept (Harter, 1986). In this domain-specific approach Harter (2013) proposed that individuals form their perceptions in five different competence areas, which include: scholastic competence, athletic competence, social acceptance, behavioral conduct, and physical appearance. Furthermore, from a cognitive-developmental perspective there are changing cognitive structures that determine the self-concept through different periods of an individual’s life. Hence, the self or self-concept should not be regarded as a static construct but rather as a dynamic developing entity that is determined by various and changing social antecedents. It is such social experiences (i.e., interactions and relationships) that dictate the content and valence of self-evaluation.

Harter (2012) also proposed that although consistency within relationships may be desirable it can be maladaptive as individuals need to adjust their behavior to the nature of each interpersonal relationship and its situational context. Thus, the self is cognitively constructed to adapt to different situations and environments. It is “an arbitrary or socially constructed identity” (Harter, 2012, p. 5) as people try to distinguish between their real and ideal self-concept. This distinction happens across different relationships and situational contexts further contributing to the dynamic nature of the self-concept; there are multiple selves that are developed as a social construct.

Harter (2012) proposed that in this construction the opinion of others plays a meaningful role in influencing the content and valences of an individual's self-representations, as these opinions are internalized to form personal judgements about the self. For example, an individual who experiences a loving and supportive environment will likely create a working model of the self as lovable and competent. In contrast, someone who is constantly rejected and does not receive support will likely develop a working model of the self that is unlovable and incompetence. Therefore, the influence of others is an essential factor in the construction of the self as individuals internalize the standards and values of significant others around them. "Significant others are the social mirrors into which we gaze for feedback about the self" (Harter, 2012, p. 170). In addition to these opinions the self-concept is also based on interpersonal relationships with those in their environment and the evaluation of how significant others perceive individuals attributes (Harter, 2012).

Furthermore, Harter (2012) also suggested that there are affective reactions that can determine the self-concept. More specifically, the evaluation of others creates certain emotional reactions, which include among others pride, shame, guilt, embarrassment, and humiliation:

Over the course early development, the I-self eventually becomes 'conscious' of the Me-self. That is, it comes to take the Me-self as an object of reflection and evaluation, producing an emotional reaction. Thus, the I-self develops the ability to be proud of the Me-self, or, alternatively to be ashamed of the Me-self" (Harter, 2012, p. 195).

However, it should be noted that these emotions cannot be regarded independently as being able to verbally acknowledge pride or shame represents a developmental acquisition that is dependent on cognitive skills and socialization experiences (Harter, 2012).

## **Self-competence in Sport**

Competence appears to be an important consideration within the athletic environment as athletes are typically asked to compete against others. Researchers have found that self-competence in sport can vary based on factors such as age, actual ability, and competitive level (e.g., Horn & Weiss, 1991; Weiss & Amorose, 2005). Therefore, it appears important to consider developmental factors when exploring perceptions of ability. As previously stated at the most general level Harter (2012) characterized the self as self-representations about how one describes oneself. While such assessments are certainly a valuable consideration in the sport context Harter's (2012) model appears to focus more on self-evaluations and less on interactions and relationships with others in the environment that have been shown to play a significant role in the experience of athletes (Mageau & Vallerand, 2000).

## **Self-competence Measures**

The Self Perception Profile for Children (SPPC; Harter, 1985b) is a revision of the Perceived Competence Scale (Harter, 1982) and assesses both domain specific and global measures of self-worth. Subscales related to physical appearance and behavioral conduct have been added to this more current instrument to complement social, athletic competence, and academic ability. Each domain consists of 6 questions in which individuals are presented with pairs of statements and asked to choose the one that best describes them. Subsequently, they rate the extent of agreement from "sort of true" to "really true" and also indicate the importance of each domain.

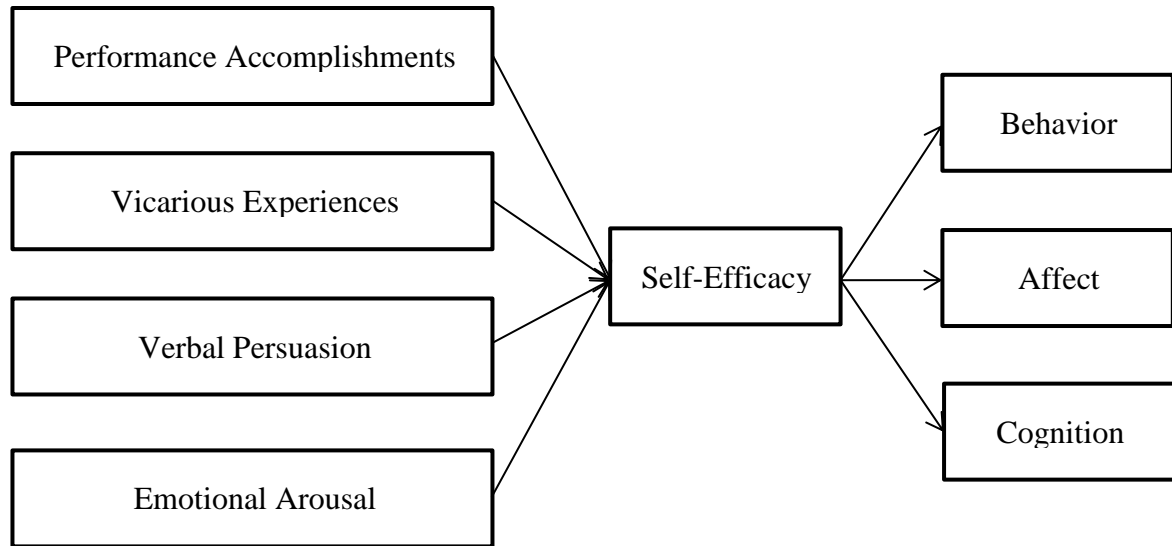
**Critique of self-competence measures.** The SPPC is an age-appropriate instrument that allows researchers to assess self-competence for children. Therefore, the measure takes developmental components into considerations as individuals' cognitive abilities and perceptions



change over time. Furthermore, the instrument also entails an athletic competence subscale that can be utilized within the sport context.

### **Self-efficacy**

When trying to understand how individuals conceptualize the self it is crucial to also take into consideration how they perceive their skills and capabilities to execute courses of action that are required to deal with respective situations (Bandura, 1986; Schunk, 1989). These perceptions are important determinants of human behavior as they can not only influence people's initial engagement but affect the availability of coping strategies and efforts (Bandura, 1977). Thus, individuals' level of conviction in their ability to engage in a behavior successfully will not only determine their effort but typically also how long they persist when faced with adversity (Bandura, 1977). Bandura (1977) coined such behavioral assessments as self-efficacy, which has been defined as "the conviction that one can successfully execute the behavior required to produce the outcomes" (p. 193). In this context, the outcomes can vary based on the desired behavior (i.e., what am I trying to accomplish) as well as environmental factors (i.e., where am I trying to accomplish it). This characterization is based on the assumption that efficacy expectations stem from psychological procedures, such as previous accomplishments, vicarious experiences, verbal persuasion, and emotional arousal (Bandura, 1977).



*Figure 2. Sources of self-efficacy*

When comparing self-efficacy to the more general concept of self-esteem Baumeister (1999) argued that “self-esteem is an assessment of being, whereas self-efficacy refers to doing: It is the belief that one can accomplish tasks successfully” (p. 281). Marsh (1990) similarly suggested that “self-esteem pertains to self-worth and ‘how well one’s behavior matches personal standards of worthiness,’ whereas self-efficacy is concerned with personal capabilities. Thus, responses to self-esteem and self-concept items are typically evaluative, whereas self-efficacy responses are more purely descriptive” (Marsh, 1990, p. 98).

### **Self-efficacy in Sport**

In sport, performance accomplishments have been shown to be the most influential source (Chase, Feltz, & Lirgg, 2003; Feltz & Lirgg, 2001) as self-efficacy appears to mediate the effects of environmental factors and prior accomplishments on subsequent behavior (Marsh, 1990). Multiple researchers have been interested in using self-efficacy as a predictor for

competition performance. While training outcomes are important they may not always be an ideal predictor for competition performance as individuals can practice well and still compete poorly. Self-efficacy appears to be a factor worth exploring as Bandura (1977) already suggested a causal relationship between confidence (i.e., self-efficacy) and performance in all activities. Furthermore, he argued that it is likely more useful to explore specific levels of self-efficacy as they apply to specific behaviors (e.g., athletics). Evidence for the efficacy-performance relationship has been found in a wide range of activities (e.g., Bandura, Adams, Hardy, & Howells, 1980; Bandura & Schunk, 1981; Kazdin, 1980) and it, therefore, seems justified to also explore it in the athletic context. Researchers have found that self-efficacy does indeed appear to predict motor (e.g., Feltz et al., 1979; Weinberg, Gould, Yukelson, & Jackson, 1981; Weinberg, Yukelson, & Jackson, 1979) and athletic performance (e.g., George, 1994).

In these endeavors, particular interest has been given to the role of self-efficacy in competitive gymnastics. McAuley and Gill (1991) indicated that efficacy significantly predicted the performance for collegiate gymnasts. This effect accounted for substantial amounts of the variance in performance scores in various exercises including the beam ( $R^2 = .349$ ), floor, ( $R^2 = .187$ ), and bars ( $R^2 = .514$ ). Similar results were evident for female undergraduate students' ( $N = 39$ ) performance on a balance beam, which was significantly predicted by self-efficacy ( $r = .72$ ,  $p < .05$ ). These findings were further supported by research conducted with youth populations. Lee (1982) found that 14 youth competitive gymnasts' ( $M = 9.7$  years of age) estimates of performance (i.e., self-efficacy) had a statistically significant correlation with performance outcomes in competition ( $r = .55$ ,  $p < .05$ ). Similarly, Weiss, Wiese, and Klint (1989) found that self-efficacy had a statistically significant relationship with 22 boys' ( $M = 11.5$  years of age) performance on five of the six gymnastic events (i.e., high bar, pommel horse, floor exercise,

parallel bars, still rings) as well as their all-around performance. These correlations ranged from .27 to .84 ( $M = .36$ ) and can mainly be considered moderate or high. Furthermore, Weiss and colleagues (1989) utilized nonstepwise multiple regression analyses to demonstrate that self-efficacy significantly predicted athletes' all-around performance [ $F(4, 17) = 2.94, p < .05$ ]. This explained 39.4% of the variance in the performance measure. In addition, coaches have been shown to play an important role in determining athletes' self-efficacy (Feltz & Lirgg, 2001; Vargas-Tonsing, Warners, & Feltz, 2003; Vealey, Hayashi, Garner-Holman, & Giacobbi, 1998). Vargas-Tonsing, Myers, and Feltz (2004) surveyed 1233 National Collegiate Athletic Association Division I and II athletes ( $M = 19.68$  years of age,  $SD = 1.08$ ) and found that they perceived coaches use of instruction-drilling, acting confident themselves, and encouraging positive talk were most helpful in enhancing their perceptions of self-efficacy.

### **Self-efficacy Measures**

The General Self-Efficacy Scale (Jerusalem & Schwarzer, 1995) is a 10-item instrument that was developed to assess individuals' perceived ability to cope with various life demands (e.g., "I can always manage to solve difficult problems if I try hard enough"). Participants indicate their behavioral beliefs on a Likert-type scale from 1 (not at all true) to 4 (exactly true). The GSE was originally created in German and has since been translated into 33 different languages.

**Critique of self-efficacy measures.** Researchers have indicated that the GSE has high reliability, stability, and construct validity in multiple languages and nations (e.g., Leganger, Kraft, & Roysamb, 2000; Schwarzer, Mueller, & Greenglass 1999). More specifically, Cronbach alpha ranges from 0.75 to 0.94 were found across a number of different language versions (Rimm & Jerusalem, 1999; Luszczynska, Scholz, & Schwarzer, 2005). Self-efficacy has been

developed as a construct that represents individuals' perceived abilities. Therefore, it appears reasonable to suggest that the GSE can also be modified to measure such perceived ability in the sport context.

### **Self-determination**

Given the influence of self-concepts (e.g., self-competence, self-efficacy) on behavioral outcomes (e.g., athletic performance), it appears justified to further explore this relationship between cognition, affect, and behavior. These elements seem strongly connected as cognition and mechanistic processes need to be examined in order to explain behavioral outcomes. Within the motivation literature, the debate about the reason for an individual's actions can be classified into two different categories: "first, whether behavior is caused by variables in the environment or variables in the person; and, second, whether, if one considers the person at all, phenomenological variables or non-phenomenological, mechanistic variables are the appropriate ones for consideration" (Deci & Ryan, 1980, p. 33).

**Behavioral Regulation.** According to Deci and Ryan (1980) it is important to understand that it is ultimately a combination of both person and environment variables that leads to a person's actions. Self-determination theory (Deci & Ryan, 1980) offers a lens to understand these processes. In essence, Deci and Ryan (1980) suggest that human behavior is typically driven by motivation. Thus, behavioral regulation dictates whether an individual engages in an action, as well as how much determination and persistence that action is done with. "Because motivation refers to the why of behavior, the reasons for doing an activity are generally perceived as indicative of the person's motivation toward a given activity" (Vallerand & Losier, 1999, p. 143). The reasons for behavior can come from a variety of different sources. Self-

determination theory (Deci & Ryan, 1980) posits that a person may experience a variety of forms of motivation that lie on a continuum from amotivation to intrinsic motivation.

Table 1

*The continuum of motivation.*

	Extrinsic Motivation				
Amotivation	External Regulation	Introjected Regulation	Identified Regulation	Integrated Regulation	Intrinsic Motivation
Lack of contingency between behavior and outcome	Activity is done to receive a reward or avoid punishment	Activity is done to avoid negative internalized feelings	Activity is freely chosen to help achieve another goal	Activity is part of a person's identity	Activity is done as an end in itself
Non-self-determined Motivation			Self-determined Motivation		

**Basic psychological needs.** Whether individuals engage in behaviors for self-determined or non-self-determined reasons depends on the degree of their satisfaction of the three inherent basic psychological needs of competence (the need to interact effectively with the environment), autonomy (the need to be the director of one's actions that are in accordance with one's values), and relatedness (the need to be valued and accepted; Deci & Ryan, 2000). The fulfillment of these needs will ultimately help individuals "identify with the importance of social regulations, assimilate them into their integrated sense of self-and thus fully accept them as their own" (Deci & Ryan, 2000, p. 236). Thus, the three basic psychological needs are a valuable consideration

when trying to understand the self as they lie at the core of cognitions, affections, and behavior. They dictate the “what” and “why” of human behavior and are the psychological nutrients of goal pursuits. Further, “the concept of needs refers to elements deemed necessary to facilitate the growth and actualization of human potentiality” (Vallerand & Losier, 1999, p. 144). Thus, in looking at self-determination in sum:

Just as one can conclude that plants need water by noting that they flourish when they are hydrated but that impoverished growth and, ultimately, a breakdown of integrity results when they are systematically deprived of water, SDT maintains that a psychological need can be identified by observing that positive psychological consequences results from conditions that allow its satisfaction and negative consequences accrue in situations that thwart it (Deci & Ryan, 2000, p. 229).

### **Self-determination in Sport**

Overall, fostering self-determined extrinsic and intrinsic motivation can have many positive cognitive, affective, and behavioral consequences (Deci & Ryan, 2000) that are important considerations in the sport context. For example, athletes who were self-determined gave more effort, experienced lower levels of performance-related anxiety, and had higher levels of well-being in and out of sport compared to athletes who did not demonstrate self-determined motivation (Mack et al., 2011; Vallerand, 1997; Vallerand & Losier, 1999). Furthermore, Podlog and Dionigi (2010) revealed that self-determined motivation was related to persistence when faced with adversity (e.g., injury) and enhanced psychological states in the rehabilitation process (e.g., decreased perceptions of threat, unfairness, and ego damage). While these outcomes are meaningful in their own right, it is also valuable to note that a positive relationship has been

found between self-determined motivation and success in competition (Gillet, Berjot, & Gobance, 2009). Hollembeak and Amorose (2005) summarized these benefits:

Intrinsically motivated individuals are more likely to choose to participate and work hard when extrinsic rewards and reinforcement are not available, experience lower levels of performance-related anxiety, and exhibit greater levels of skill learning relative to those with a more extrinsic motivational orientation (p.21).

Therefore, self-determination appears to be an important consideration and essential part of individuals' self.

**Coaches' influence on athletes' self-determination.** While individuals' basic psychological need satisfaction and consequently motivation can be influenced by various social factors in the environment (Vallerand, 1997) coaches appear to play a particularly meaningful role in the sport context (Mageau & Vallerand, 2003). Amorose and Anderson-Butcher (2007) explored the influence of coaches on 581 athletes' (263 male and 318 female;  $M = 17.5$  years of age,  $SD = 2.30$ ) basic psychological need satisfaction and consequently their motivational orientation. More specifically, Amorose and Anderson-Butcher (2007) tested whether perceived basic psychological need satisfaction mediated the relationship between autonomy-supportive coaching and motivational patterns. It became evident that competence, autonomy, and relatedness all predicted athletes' motivation and determined the degree of self-determination they experienced. Likewise, coaches' use of autonomy support positively related to athletes' need fulfillment and had an indirect effect on motivation.

### **Self-determination Measures**

The Sport Motivation Scale (SMS; Pelletier et al., 1995) consists of seven subscales that measure different types of motivation: amotivation (e.g., "it is not clear to me anymore; I don't



really think my place is in sport”), external regulation (e.g., “for the prestige of being an athlete”), introjected regulation (e.g., “because I would feel bad if I was not taking time to do it), identified regulation (e.g., “because it is a good way to learn lots of things which could be useful to me in other areas of my life”), and three types of intrinsic motivation (to learn, to master, and to experiences sensations; e.g., “for the pleasure it gives me to know more about the sport I practice”). The instrument includes 28 total items each of which is answered on a Likert-type scale (1 = strongly disagree, 5 = strongly agree).

The Basic Psychological Needs Scale (BPNS, Deci et al., 1989) is a 21-item questionnaire aimed at assessing individuals’ perceptions of competence (6 items; e.g., “Often, I do not feel very competent”), autonomy (7 items; e.g., “I feel like I am free to decide for myself how to live my life”), and relatedness (8 items; e.g., “The people I interact with regularly do not seem to like me much”). Items within each subscale are rated using a Likert-type scale from 1 (not at all true) to 7 (very true).

**Critique of self-determination measures.** The SMS has been developed specifically for the sport environment and offers an instrument that considers the contextual factors of that setting. Perhaps therefore, it has been employed frequently in the sport psychology literature (e.g., Amorose & Anderson-Butcher, 2007; Hollembek & Amorose, 2005). Furthermore, Li and Harmer (1996) evaluated the psychometric properties of the SMS in a sample of 857 college students, with the validity of the SMS being supported by a confirmatory factor analysis. In addition, the scale had demonstrated test-retest coefficients from .58 to .84 (Ostrow, 1996). Thus, the SMS appears to be a valid and reliable instrument that can be utilized to measure self-determination in the athletic context.

While the BPNS was not created explicitly for the sport context it has been modified by previous researchers within sport psychology to assess athletes' basic psychological need satisfaction (e.g., Readdy, Raabe, & Harding, 2014). In general, Baard, Deci, and Ryan (2004) showed evidence of the instrument's validity with a confirmatory factor analysis that supported the structure and demonstrated the discriminant validity of the different basic psychological needs. Additionally, the scale's internal consistency reliability (i.e., alpha coefficients) was above .70 (Baard et al., 2004). Finally, a test-retest reliability of .80 indicated temporal stability (Baard et al., 2004).

### **The Physical Self**

Since James' (1892) foundational work researchers have recognized the content and function of physical aspects of the self. Thus, this conceptualization of the self adds an element to other more cognitive constructs. Specifically, the physical self is individuals' perceptions of themselves in the physical domain. This includes multiple competencies and appearances, including perceptions of strength, endurance, sport ability, and body image (Fox & Corbin, 1989). The Physical self-concept is an essential psychological outcome, correlate, and antecedent of physical activity behavior (Fox, 2000). Additionally, this physical self-worth has been found to also play an important role in determining individuals' global perceptions of their self-concept (Fox, 1997).

### **The Physical Self in Sport**

In a context that is centered around physical activity it appears reasonable to suggest that the physical self plays a fundamental role in the sport environment. However, it should also be noted that other more cognitive or affective components of the self are meaningful contributors

to athletes' self-perception and should not be neglected. Thus, the physical self can be considered as a valuable compliment to other self-concepts.

### **Physical Self Measures**

The Physical Self-Perception Profile (PSPP; Fox & Corbin, 1989) assesses the physical self on four subdomains as well as an overarching construct of physical self-worth (i.e., general feelings of happiness, satisfaction, pride, respect, and confidence in the physical self). Similar to Harter (1986), a Perceived Importance Profile (PIP) has been incorporated to allow participants to assign importance weights to each subdomain of the physical self (Fox, 1990). In its revised version (PSPP-R; Hagger, 2007) the instrument includes six items per subscale and a 4-point Likert response format.

**Critique of physical self measures.** In its original form the PSPP was often criticized for its idiosyncratic response scale (e.g., Marsh, Richards, Johnson, Roche, & Tremayne, 1994). Participants were forced to first choose between two statements and subsequently indicate their agreement with the statement. Furthermore, researchers indicated that the wording of the items (i.e., positive or negative) created random errors (e.g., Hagger et al., 2007). However, it appears that these issues have been addressed and the PSPP-R offers a valid instrument to assess individuals physical self-concept.

### **Self-Understanding**

In general, it becomes apparent that individuals' behavior appears to play a meaningful role in how they conceptualize the self. Self-competence (Harter, 2012), self-efficacy (Bandura, 1977), and self-determination (Deci & Ryan, 2000) are frameworks focused on this relationship between cognition, affect, and behavior. While these rather situation- and context-specific considerations are valuable Damon and Hart (1988) suggested that people also have a more

general understanding of themselves. This understanding of oneself is something that humans are interested in at an early age and this intrigue continues through their life. They suggested a conceptual system that they called self-understanding, which is based on individuals' thoughts and attitudes about themselves. More specifically, self-understanding can be considered a cognitive self-organizer of experiences that provides continuity across these possible fluctuations. Hence, "it offers a basis for considering one's jumble of personal experiences as one connected life rather than as many disconnected fragments" (Damon & Hart, 1988, p. 2). Thus, self-understanding incorporates all considerations that can distinguish the self from others, including "physical and material qualities (e.g., size, possessions), activities and capabilities (e.g., hobbies, talents), social or psychological characteristics (e.g., manners, habits, dispositions), and philosophical beliefs (e.g., moral values, political ideology)" (Damon & Hart, 1988, p. 1). Simultaneous with changes and consistencies in these elements are the changes and consistencies in a person's self-understanding over time. An important consideration within the concept of self-understanding is individuals' self-interests and how these may differ from the interests of others. Accordingly, self-understanding is also an organizer of an individual's social world and provides the foundation for self-esteem, shame and guilt, and personal identity (Damon & Hart, 1988). However, in contrast to "other conceptual systems, the self must do the understanding of itself" (Damon & Hart, 1988, p. 2) as the self is determined by the person and not matter of consensual validation. In general, self-understanding incorporates both the I-self and the Me-self. Thus, Damon and Hart (1988) proposed this type of self-concept in contrast to the self-concept which generally only incorporates the Me-self. However, while emphasizing the I-self it should also be noted that self-understanding does not include the actual I, which extends beyond the scope of self-understanding.

Damon and Hart (1988) proposed a model of self-understanding composed of two dimensions (i.e., the self-as-object and the self-as-subject), which was based on the following patterns that had emerged throughout the literature:

- (1) An early awareness of self based on one's own activity and contingencies arising from such activity; (2) An early awareness of physical categories of self like gender and size; (3) An age-related shifts from defining oneself through external characteristics (physical, material, and active categories) to defining oneself through internal qualities (psychological and 'spiritual' categories); (4) An age-related tendency to integrate the diverse aspects of self into a seemingly coherent system (p. 54).

However, Damon and Hart (1988) also argued this surface to depth perspective (i.e., physical to psychological) that is quite common to describe self-concepts in the literature does not provide a comprehensive and adequate representation of self-understanding by itself.

Developments in the self-as-object are represented by what Damon and Hart (1988) referred to as the front-face progression. This incorporates the Me-self in four basic schemes: the physical, active, social, and psychological. In contrast to other researchers who believe that there is a true developmental shift (e.g., between the physical and psychological) Damon and Hart (1988) suggested that while there may be developmental changes throughout life, individuals typically have some understanding of their physical, active, social, and psychological selves at all times. Therefore, potential variations signify a conceptual reorganization rather than a modification in preference or tendency. In other words, people may transition through different levels in regard to their physical, active, social, and psychological self, but earlier forms of self-understanding never quite disappear. This emphasizes the hierarchical nature of Damon and Hart's (1988) conceptualization as individuals progress through four different levels but continue

to incorporate their understanding from previous levels into new forms of organization; the four levels are linked together in varying patterns. However, “even where developmental levels are parallel in some respects, they may not be in others; and such divergences no doubt lead to discrepancies in subjects’ understanding across the concept’s multiple facets” (Damon & Hart, 1988, p. 171). Therefore, stability in the self-concept is difficult to achieve as constructs inevitably change. Typically developmentalists have suggested “choosing for study the organizational features of the behavioral system in question, rather than the behavioral pattern in and of itself” (Damon & Hart, 1988, p. 113). These tend to change only slowly, if at all. Damon and Hart (1988) made the claim that stability should be considered as orderly change instead of absolute behavioral consistency. Thus, self-understanding incorporates complex diversity between the unique features that make up the self. This means that searching for general structures that determine the development across different domains fails to recognize their unique characteristics and individuals intentionally change their behavior to coordinate them with others in their social environment (Damon & Hart, 1988).

In level one (i.e., categorical identifications) of Damon and Hart’s (1988) hierarchical model:

The self is understood as a number of separate categorical identifications with taxonomic value only. Categories like group memberships, typical activities, and physical characteristics are offered as simple face descriptions without further underlying significance. This is because they are seen as sufficient in themselves. No relational links between the various categorical identifications are expressed, and many self-descriptions therefore have a transductive quality (p. 59).

This initial phase entails a fundamental identification of the Me-self with little else but a face description. In level 2 “the self is defined in relation to others and to normative physical or social standards. Self-understanding focuses on comparisons between the performances and capabilities of self versus the performances and capabilities of real or imagined others” (Damon & Hart, 1988, p. 61). In this process, self-understanding is primarily focused on the concepts and implications that determine the nature of interactions with others. In level 3 “self-statements, the comparative mode of Level 2 is transformed in the assessment of one’s capacities for conducting interpersonal relationships” (Damon & Hart, 1988, p. 64). In Level 4:

Categories of the self-as-object are organized through systematic beliefs and life plans.

Characteristics of self draw their meaning for one’s identity through such beliefs and plans, which may include philosophical or moral belief systems, ideological choices, or any variety of personal goals (Damon & Hart, 1988, p. 67).

These beliefs and plans develop a new coherence in self-understanding that incorporates self-defining categories creating a consciously systematic conception of the self.

Developments in the self-as-subject are represented by what Damon and Hart (1988) referred to as the side-face progression. This part of the model entails three components (i.e., agency, continuity, and distinctness), which also develop across the four different levels.

Agency, which entails the formation of self, is initially determined by biological factors and transitions to an emphasis on individual characteristics (e.g., talents, abilities, wishes, motivation, of efforts). As interpersonal relationships gain importance agency becomes increasingly based on communication with others before and finally personal or moral evaluation of life possibilities.

Continuity entails the degree to which the conception of the self changes over time. Finally, distinctness allows individuals to distinguish themselves from others. It is important to note that

these elements are responsible for developing an understanding of the I-self rather than the developing of the I in itself. Being aware of these experiences allows individuals to distinguish between events that are within their volitional intent as opposed to those determined by uncontrollable forces within or beyond the self. The nature of this awareness determines the extent to which one feels that events are subject to one's volitional intent as opposed to uncontrollable forces beyond or within the self. Therefore, the conception of agency is based on the degree of self-determination that is experienced by individuals (Damon & Hart, 1988), indicating a link to Deci and Ryan's (2000) proposed framework.

### **Self-understanding in Sport**

The hierarchical nature of Damon and Hart's (1988) framework appears to be particularly helpful to conceptualize the self within the context of sport. While individuals develop and change over time and are influenced by their interactions and relationships with others as also suggested by Lewis (1990) and Baumeister (1999) it at the very least seems questionable that there are not affected by earlier developments. Damon and Hart's (1988) argument that changes are due to reorganization rather than mere preferential shifts appears justified. For example, it is likely that adult athletes are still influenced by self-perceptions from their childhood.

### **The Multidimensional Self-concept**

In his review of the previous research and personalized overview of his self-concept Marsh (1990) argued that while the construct has received considerable consideration there is only weak empirical support for its usefulness based on research conducted prior to the 1980s. He argued that similar to other psychological constructs everybody 'appears to know' what the self-concept is and therefore researchers frequently do not feel compelled to offer sound



theoretical definitions or psychometric properties of what they are actually measuring. Furthermore, he suggested that much research employed a between-construct focus (i.e., relating self-concept measures to other construct) and, therefore, not enough attention has been given to within-construct issues. This has also lead to a lack of appropriate and comprehensive instruments (Marsh, 1990). Thus, most of the early research has emphasized a global self-concept, which neglects the multidimensionality that was has been suggested as early as William James' (1892) initial work in the field.

In this context, most investigations utilized the self-concept as a single score to represent an overall, total, or general self-concept defined through several different definitions (see Marsh & Shavelson, 1985) including:

- (1) An agglomerate self-concept is a total score for a broad, typically ill-defined collection of self-report items.
- (2) A relatively unidimensional self-concept scale refers to a separate, distinguishable facet that is comprised of characteristics such as self-confidence and self-competence. This type of general self-concept is sometimes referred to, albeit ambiguously, as self-esteem.
- (3) A weighted-average general self-concept is based on the assumption that the contribution of a specific component of self-concept to overall self-concept should be based on the saliency or importance of the specific component to a particular individual.
- (4) A higher-order self-concept is an inferred construct which is not measured directly (Marsh, 1990, p. 92-94).

However, measuring such a general-self is superordinate to specific facets of self-concept. Overall, the self-concept appears to be related to a multitude of other self-constructs such as anxiety, motivation, self-attribution, and self-efficacy (Marsh, 1990). Fox (1997) similarly suggested that the self-concept can be understood as the attitudes and roles individuals use to

evaluate their own self. Thus, the self is both an entity and a process as individuals experience themselves in the moment as a unified organization of cognitions, affects, and behaviors; however, this organization can be change over time and across domains (Markus & Nurius, 1986). Researchers have efforts supported the multifaceted structure of self-concept and indicate that self-concept cannot be understood adequately if its multidimensionality is ignored (Bryne, 1984; Marsh & Shavelson, 1985). Specifically, Marsh has provided factor analytical support for the multidimensionality of the self-concept (Marsh, 1988). Thus, he concluded that “an important task that has not been pursued sufficiently is to integrate the different self-related constructs into a unified theory of self” (Marsh, 1990, p. 97).

Marsh (1990) highlighted the construct of self-efficacy as one facet that is particularly associated with this multidimensionality of the self-concept. Self-efficacy is content-specific and such perceptions are therefore more closely related to specific behaviors; it emphasizes the dynamic role of particularized indices of self-efficacy as a mediating variable. Thus, self-efficacy researchers frequently focus on one narrowly defined domain and do not consider how those measures might differ in other domains.

In sum, Marsh (1990) concluded that:

If the role of self-concept is to better understand the complexity of self in different contexts, to predict a wide variety of behaviors, to provide outcome measures for diverse interventions, and to relate self-concepts to other constructs, then the specific facets of self-concept are more useful than a global indicator... I am not arguing that researchers should not use global self-concept measures, but rather that more emphasis needs to be placed on content-specific dimensions of self-concept (p. 100).

## **The Multidimensional Self-concept in Sport**

As previously indicated, this multidimensionality, which considers situational and contextual factors, appears justified in the sport context as well. More explicitly, it seems reasonable to suggest that the self-concept varies depending on context (e.g., practice versus competition) and specific situations (e.g., morning versus afternoon practice). At a more general level, individuals' self-perceptions will likely differentiate based on the sport they engage in. For example, somebody can have a different self-concept in regard to their participation in soccer compared to baseball.

### **Multidimensional Self-concept Measures**

The Multidimensional Self Concept Scale (MSCS; Bracken, 1992) assesses the self-concept as a multidimensional and context-dependent pattern of behavior that reflects past behavior. Such previous experience will ultimately influence current and predict future behavior. The scale evaluates the self-concept in the six domains that have been deemed most important by the researchers. These individual domain measures can be utilized independently based on researchers' interest. Specifically, it consists of 150 positive and negative phrases from both a personal and 'other perspective' (e.g., "I am not accepted by people who know me" or "My parents care about my future:), which are evaluated utilizing a 4-point Likert scale response format (i.e., "Strongly agree" to "Strongly disagree").

**Critique of multidimensional measures.** The MSCS allows for a multidimensional assessment of the self-concept. Therefore, it appears to offer a more comprehensive insight into six different domains that the instrument comprises. The measures applicability to the sport context would have to be assessed in future research.

## Self-schema

While it is important to consider how individuals conceptualize the self Lewis (1990) argued that this process is largely determined by their desire to interact effectively within the environment. According to Lewis (1990), self-schema (i.e., identity) is the overall knowledge of individuals regarding themselves. In essence, this schema entails the following questions: “(1) Who am I? (2) What is my relationship to others? and (3) How do I feel about them?” (Lewis, 1990, p. 278). In contrast, self-awareness and self-consciousness only refer to their final cognitive level, which is a more acute conceptualization of the self characterized by a realization of thoughts, feelings, and behaviors. These concepts should be considered distinct as people may have self-knowledge but they do not always have self-awareness. While this may seem counterintuitive, many cognitions and behaviors do not involve any reflection of the self. More specifically, many behaviors occur without any deliberation at all. “The self sets goals, has intentions, and evaluates, but specific behaviors are executed through simpler processes of associations and learned or overlearned response patterns” (Lewis, 1990, p. 284). Almost all social animals are eventually able to distinguish between self and others and eventually conserve that differentiation across space and time. However, only humans, and perhaps chimpanzees, can achieve self-awareness in which self-recognition becomes less dependent on contingency. Individuals are conscious of their own self among others and reflect on their own actions, thoughts, and feelings. It is this awareness that can lead to emotions such as embarrassment, shame, pride, and guilt and represents the highest level of identity. Such consciousness is achieved when people begin to make references to themselves by using personal pronouns (e.g., “me” or “mine”). While infants typically reach this level at about 15-18 months of age, Lewis (1990) suggested that humans continue to develop their self-concept over the course of their life.

Such social and emotional development is influenced by individuals' cognition. Self-awareness and self-consciousness are critical factors for understanding social development as they contribute to social relationships and emotional states. However, Lewis (1990) also stated that:

There is no reason to believe that because certain social behaviors require certain cognitive capacities, cognitive development controls or orders social development. It is just as likely that particular social capacities give rise to particular cognitive behaviors and that cognitive development is as dependent on social development as the reverse (p. 277).

Lewis (1990) argued that individuals construct new structures as they try to cope with their cognitive ability to interact within their given environment. Thus, no linear model can adequately conceptualize development as individuals adjust to varying contexts.

**Identity.** According to Lewis (1990), there are three overarching tasks within these adjustments that individuals attempt to accomplish, which are identity, culture, and reproductive success. Identity “refers to the development of a self. Its function is to connect an individual to a particular set of conspecifics” (Lewis, 1990, p. 278). While other organisms mainly develop their identity based on experience for humans this process is primarily affected by cognitions or beliefs about oneself. These beliefs are referred to as self-schema and as previously mentioned are determined by the consciousness of similarities and differences from others in the environment. This distinction allows individuals to determine who they are and where they belong and thus places them in a particular social setting of similar organisms. In addition, the self-concept is developed based on learning how to function within social groups (Lewis, 1990). These abilities, which can also be referred to as competencies, can either be developed

instinctual or learned. For humans most abilities are acquired through a learning process. In contrast to Deci and Ryan's (2000) concept of competence which are primarily individuals' perceptions of their ability Lewis' (1990) concept is related more to actual abilities. Additionally, people also need to learn about social roles, which "provide the social scripts that define one's behavior vis-à-vis other social conspecifics" (Lewis, 1990, p. 279). These roles can be constant or change over the course of an individual's life.

**Culture.** Lewis (1990) argued that social relationships, which play a foundational role in individuals' conceptualization of the self, are dependent on their self-awareness. Relationships can be summarized as a negotiation between two individuals that develop from social interactions and thus require a certain level of self-awareness. According to Hinde (1976) there are six lower level dimensions that characterize relationships: "(1) goal structure, (2) diversity of interactions, (3) degree of reciprocity, (4) meshing of interactions, (5) frequency, (6) patterning and multidimensional qualities of interactions" (Lewis, 1990, p. 289). While these levels could certainly be achieved without self-awareness they also fall short of describing a higher-level human relationship, which requires "(7) cognitive factors, or those mental processes that allow each member of an interaction to think of the other member as well as of himself or herself; and (8) penetration something having to do with ego boundaries" (Lewis, 1990, p. 289).

**Reproductive success.** Finally, Lewis (1990) suggested that individuals' development requires them to acquire the abilities to reproduce, which entails their ability to make friends (especially with members of the opposite sex), physically mate, and raise the resultant offspring. These social behaviors are typically experience sequentially. The focus on reproductive success also exemplifies the heterosexist focus of Lewis' (1990) approach, which neglects a more holistic understanding of the self-concept.

## **Self-schema in Sport**

While it is unlikely that individuals engage in sport to acquire the ability to reproduce relationships are an important consideration with the athletic context. For example, the coach-athlete relationship has been shown to be an important determinant of athletes' experiences (Mageau & Vallerand, 2003). Thus, Lewis' (1990) emphasis on relationships and their role in determining the self appears to have some merit in the sport setting.

## **Self-knowledge**

Similar to Marsh's (1990) multidimensional consideration of the self-concept Baumeister (1999) suggested that it is essentially difficult to incorporate every aspect that makes up the self into a single self-concept as "human selfhood depends on the capacity for reflexive consciousness, which is to say that the human mind is remarkably able to turn attention toward itself and construct extensive knowledge of itself" (Baumeister, 1999, p. 4). Instead Baumeister (1999) coined the term self-knowledge and suggested that:

It may be more appropriate to speak of a large stock of self-knowledge, of which only a small part is conscious at any given time. The conscious part may tend to resemble a self-concept in that it is largely coherent and integrated. The full stock of self-knowledge, however, is free to contain gaps, contradictions, inconsistencies, and plenty of material that is at best very loosely connected together (p. 5).

In general Baumeister (1999) offered three major experiences that build the foundation of selfhood. First, individuals experience reflexive consciousness. The conscious human mind can turn its inquiring attention back toward its own source and seek the self leading to self-awareness. This is an essential process as Baumeister (1999) suggest that the concept of self would be meaningless if individuals were unable to gain awareness of themselves. However, at

this stage the self is not understood directly but rather through observation and inference from social interactions. Second, individuals develop their self-concept as:

A member of groups and relationships, and indeed one of the crucial functions of the self is to enable people to relate to others. The self is not created nor discovered in social isolation, through looking inward. Instead, the first things that the child learns about its self involve its connections to others (as in being a member of a certain family) and about how its traits set it apart from others (as in being male or female; Baumeister, 1999, p. 2).

Third, individuals experience the self in its executive functioning. This enables the person to:

Make choices, initiate action, and exert control over self and world. Without this, the self might still be something that could be known and could relate to other people – but it could not do anything. Terms such as ‘agent’ or ‘origin’ express this important aspect of the self” (Baumeister, 1999, p. 2).

In sum, Baumeister (1999) reasoned that self-awareness is primarily determined by focusing on the self and comparing it to an ideal, goal, or standard. For example, “when people are asked how they that they possess certain characteristics, a typical answer is that they have learned about them from other people... one’s self-concept is a reflection of one’s perceptions about how one appears to others” (Baumeister, 1999, p. 25). Thus, the self is inseparable from social interactions and includes some degree of reference to others.

### **Self-knowledge in Sport**

Similar to Lewis’ (1990) framework Baumeister’s (1999) emphasis on relationships and their influence in determining the self-concept appears to have some merit in understanding how individuals in the sport setting conceptualize the self. It should be noted that while romantic relationships exist in the athletic context it is likely primarily the coach-athlete and teammate-



teammate relationship that plays a fundamental role for athletes' and coaches' conceptualization of the self.

## **Conclusion**

In sum, a review of the literature regarding the self and various self-concepts underlines the lack of conceptual clarity within the field. Shavelson, Hubner, and Stanton (1976) suggested that the self-concept is defined by seven major features, which provides a viable summary of existing theories:

(1) It is organized or structure, in that people categorize the vast amount of information they have about themselves and relate these categories to one another. (2) It is multifaceted, and the particular facets reflects a self-referent category system adopted by a particular individual and/or shared by a group. (3) It is hierarchical, with perceptions of personal behavior at the base moving to inferences about self in subareas (e.g., English and mathematics component contribute to academic self-concept, whereas physical, social, emotional components contribute to nonacademic self-concept), and then to inferences about the self in general. (4) The hierarchical general self-concept – the apex of the model – is stable, but as one depends the hierarchy, self-concept increasingly becomes situation specific and less stable. (5) Self-concept increasingly becomes multifaceted as the individual moves from infancy to adulthood. (6) Self-concept has both a descriptive and an evaluative aspect, such that individuals may describe themselves ('I am happy') and evaluate themselves ('I do well in mathematics'; Marsh, 1990, p. 83-84).

Thus, while there are arguably similarities between the models and frameworks that have been developed over time a consensus is still missing. This makes it challenging for researchers to

choose an appropriate school of thought for their particular endeavors. However, due to the importance of behavioral outcomes within the sport context it appears reasonable to suggest that utilizing concepts that focus on behavior (i.e., self-competence; Harter, 2012; self-efficacy; Bandura, 1977; self-determination; Deci & Ryan, 2000) appear particularly appropriate for endeavors within athletics. Furthermore, due to the meaningful influence of situational and contextual factors on individuals' experiences (Vallerand, 1997) it seems justified to approach such endeavors from a multidimensional perspective (Marsh, 1990).

### **Scale Development**

Educational and psychological testing and assessment are among the most important contributions of cognitive and behavioral sciences to our society, providing fundamental and significant sources of information about individuals and groups. Not all tests are well developed, nor are all testing practices wise or beneficial, but there is extensive evidence documenting the usefulness of well-constructed, well-interpreted tests (American Educational Research Association [AERA], 2014, p. 1).

As this quote illustrates standardized tests play an essential role in the research process. They help us gather the necessary information to gain a more in-depth understanding of individuals' affects, cognitions, and behaviors. Consequently, despite their undeniable importance researchers are typically more interested in a particular phenomenon rather than the test itself. This specific construct of interest that the instrument has been developed to explore is referred to as the latent variable (see DeVellis, 2012). This somewhat indirect assessment is necessary since many latent variables cannot directly be observed and their particular value is subject to change. Thus, utilizing tests to measure a latent variable infers a relationship between the particular indicators and the phenomenon. Specifically, the latent variable determines an

indicator's value, which in turn allows for an indirect assessment of the true construct's score. Hence, every individual test indicator can be considered a hypothesized predictor of the affects, cognitions, and behaviors of interest. According to the general factor model it is several rather than one particular latent variables can contribute to a test score (DeVellis, 2012).

Depending on the nature of a test various names are used in the literature, including assessment, scale, and inventory (AERA, 2014). A scale utilizes a collection of indicators (referred to as items) "combined into a composite score and intended to reveal levels of theoretical variables not readily observable by direct means" (DeVellis, 2012, p. 11). This is a particularly valuable method when researchers are trying to assess perceptions and beliefs (DeVellis, 2012). Thus, scales can help measure construct that cannot depend on observation of behavior as an adequate indicator and utilizing several items can better capture the latent variable. The remainder of this discussion will provide valuable information for test design in general but focus on scale development in particular.

As the opening quote further indicates "not all tests are well developed" (AERA, 2014, p. 1), which highlights the need for researchers to control for a test's quality and ability to accurately measure the respective construct of interest. This can be accomplished by assessing a scale's psychometric properties. In this process, researchers have primarily focused on the elements of reliability and validity.

### **Reliability**

Reliability infers that an instrument produces scores that embody a true representation of the phenomenon it has been developed to measure. More specifically, this implies that any changes in the test's score should be solely due to a change in the actual variable. "Stated more formally, scale reliability is the proportion of variance attributable to the true score of the latent

variable” ( DeVellis, 2012, p. 31). Thus, a reliable scale is able to determine a latent variable’s value consistently and in a predictable manner and is therefore based on the assumption that there is some degree of consistency in participants’ answers across independent assessments (AREA, 2014). This entails increasing the variance that is of substantive interest and represents actual change (i.e., signal), while simultaneously limiting error sources (i.e., noise). In addition, reliability increases statistical power for a given sample size. In sum, reliability establishes that there is a higher degree of confidence in a test’s ability to identify differences of magnitude between two groups (DeVellis, 2012).

There are several methods to assess reliability, including internal consistency, alternate-forms reliability, split-half reliability, temporal stability, and inter-rater agreement (see DeVellis, 2012). Most of these techniques examine correlations to evaluate for the relationship between test items and latent variables. Internal consistency reliability is based on the notion that high correlations between individual items indicate that they are also highly correlated with the latent variable and are therefore all measuring the same construct (DeVellis, 2012). Alternate-forms reliability is assessed by administering two equivalent and interchangeable sets of items (i.e., built to the same specifications and measuring the same phenomenon). When the scores from both tests are significantly correlated with one another then the scale is reliable (DeVellis, 2012). Split-half reliability is evaluated by dividing the items of one single scale into two subsets and examining the correlations between the respective scores. To do so the initial test can be split by halves, between odd and even items, based on certain item characteristics, or randomly (DeVelis, 2012). Temporal stability, which is often referred to as test-retest reliability, entails administering the same test to the same sample on multiple occasions. If the items are accurately measuring the latent variable then there should be no difference in scores. However, this

assumption is problematic as changes in scores over time may not be due to low reliability of the instrument but may simply reflect actual changes in the construct of interest (DeVellis, 2012). Finally, inter-rater agreement depends on congruence between two independent raters or judges. This technique is more commonly used in observational research (DeVellis, 2012). Regardless of the specific method reliability assumptions are all based on assessing what variance of the variable's true score is represented by the observed score (i.e., obtained from the scale):

$$\text{True Score} = \text{Observed Score} - \text{Error}$$

$$\text{Reliability} = \frac{\text{True Score}}{\text{Observed Score}}$$

## **Validity**

However, reliability is not the only relevant psychometric property as “determining that a scale is reliable does not guarantee that the latent variable shared by the items is, in fact, the variable of interest to the scale developer” (DeVellis, 2012, p. 59). Hence, a test's validity needs to be gaged to examine whether it is not just accurately measuring a variable (i.e., reliability) but is also actually assessing the construct it has been developed to examine. More precisely, it is the interpretation of test scores that is being evaluated (i.e., what a latent variable's value represents) rather than the items itself as validity guarantees that test scores can be utilized for their intended use. Validity is often referred to as the most fundamental consideration in scale development. Consequently, the development of a valid test always requires a clear statement of the suggested interpretation of its results (AERA, 2014).

The process of validating a test's interpretations entails the process of providing sufficient scientific evidence for score interpretations (AERA, 2014). There are multiple types of validity evidence that are most commonly classified as content, criterion-related, and construct validity. While these can be used independently utilizing a multifaceted approach is important in

order to adequately and comprehensively validate an instrument (AERA, 2014). Content validity is present when there is an adequate representation of items in that they embody an exhaustive subset of the entire domain. It is “the degree to which elements of an assessment instrument are relevant to and representative of the targeted construct for a particular assessment purpose” (Hayne, Richard, & Kubany, 1995, p. 238). This means that items are utilized that comprehensively assess the latent variable (DeVellis, 2012). Evidence of construct validity necessitates a relationship between the individual items and the construct they have been developed to measure (AERA, 2014). This relationship needs to have a theoretical foundation due to the fact that the relationship between instrument and latent variable cannot be directly validated. Therefore, in order to establish construct validity test items need to be correlated with an instrument measuring a phenomenon that should theoretically be able to predict the latent variable. This can be accomplished by obtaining evidence of either associations between related constructs (i.e., convergent validity) or through an absence of such a correlation (i.e., discriminant validity; DeVellis, 2012). In contrast, criterion-related validity, which is often referred to as predictive validity, also implies that items have an empirical relationship with another criterion. Yet, this assumption does not require any theoretical basis. Criterion-related validity does not imply causal effects but is rather concerned with the strength of the relationship (DeVellis, 2012). In general, DeVellis (2012) suggested that:

If the objective is to predict an observable outcome (e.g., behavior, status, or an observed score), then criterion validity may well be the goal. On the other hand, if the objective is to predict the level of some hypothetical, unobservable construct by means of an observable indicator, the goal is likely to be construct validity (p. 66).

DeVellis (2012) further argued that face validity (i.e., whether an item simply appears to measure the construct of interest) does not represent an adequate measure of validity although it is frequently confused with content validity. However, while content validity is defined through specific procedures (e.g., review of the literature) face validity is an entirely subjective measure. Typically researchers will only develop items that they personally consider adequate in assessing the construct of interest and thus all scales hypothetically possess face validity (DeVellis, 2012). In sum, establishing validity is an important step in controlling that a scale actually measures what it has been developed to examine.

### **Fairness**

Finally, fairness is another important consideration and has been described by AERA (2014) as “a fundamental issue in protecting test takers and test users in all aspects of testing” (p. 49). This incorporates considerations of fairness in treatment during the test process, as lack of measurement bias, in access to the construct of interest, and as validity of individual test score interpretations for the intended use (AERA, 2014). These possible issues should be deliberated when administering and analyzing standardized test.

### **Scale Development**

Developing a scale that is reliable, valid, and fair can be a challenging task. DeVellis (2012) suggested several steps that can help create items that adequately and appropriately measure what they have been developed to assess and consequently control for a test’s psychometric properties (i.e., reliability, validity, and fairness). These procedures include determining clearly what it is you want to measure, generating an item pool, determining the format for measurement, having the initial item pool reviewed by experts, considering inclusion

of validation items, administering items to a development sample, evaluating the items, and optimizing scale length (DeVellis, 2012).

### **Phase 1: Conceptualization**

First, before creating any specific items it is essential to determine specifically what the scale that is being developed is supposed to measure. The statement of this explicit purpose and the interpretation of potential test scores is the foundation of scale development (AERA, 2014). Additionally, it provides essential substance as “tests are commonly administered in the expectation that some benefit will be realized from the interpretation and use of the scores intended by the test developers” (AERA, 2014, p. 19). When measuring constructs that cannot be compared to any tangible criterion (i.e., a certain belief or attitude is associated with a tangible outcome). Thus, it is essential to develop instruments based on conceptual frameworks and “one should not overlook the importance of being well grounded in the substantive theories related to the phenomenon to be measured” (DeVellis, 2012, p. 73). Furthermore, it is important to clearly differentiate the constructs of interest from other related phenomena and to determine the level of detail or generality at which it is measured (DeVellis, 2012).

### **Phase 2: Creation of Initial Item Pool**

Second, once the intent of the scale has been established an initial pool of responding items needs to be developed. These items need to specifically reflect the instrument’s construct of interest. Thus, the creation should exhaust the possible options for items within the bounds of the latent variable (i.e., content validity). While redundancy (i.e., an excessive number of repetitive items) can be an issue it is generally better to include a large number of items in this initial phase of the scale development process and to be more inclusive (DeVellis, 2012). “By using multiple and seemingly redundant items, the content that is common to the items will



summate across items while their irrelevant idiosyncrasies will cancel out” (DeVellis, 2012, p. 78). There is no definite required number of items that should be incorporated in a test’s initial pool as this is partially dependent on the construct of interest. Nevertheless, there should be considerably more items than what the finalized instrument is supposed to contain as a large number of indicators can automatically increase reliability. According to Lord and Novick (2008) this is due to signal increasing exponentially as items are added. This is in direct contrast to error which increases linearly. Therefore, it is possible to enhance an instrument’s reliability by either developing more or better items (DeVellis, 2012).

There are several considerations involved in writing appropriate and effective items. Arguably the most important concern is to avoid ambiguity (i.e., an item does not clearly state what it is supposed to assess), which can lead to unsystematic (i.e., random) or systematic (i.e., biased in one particular direction) error in measurement (Fowler, 1992). In addition, it is best to create items at a population-appropriate reading level to increase the likelihood of adequate responses. Thus, language should be utilized that is commonly used by potential participants within the population of interest. Furthermore, unnecessary wordiness should be avoided. Double negatives and double-barreled items, which entail more than just one idea and therefore do not specify which part the participant should focus on, should be avoided as well. Finally, items should not be worded or phrased with a strong point of view to potentially bias the participants (DeVellis, 2012).

### **Phase 3: Measurement Format**

Third, once an initial item pool has been created the correct measurement format needs to be chosen. In general, ratings have been found to be less time consuming than rankings (e.g., McIntyre & Ryans, 1997; Reynolds & Jolly, 1989). Likert-type scales are widely used to assess

opinions, beliefs, and attitudes (DeVellis, 2012) and therefore offered the most appropriate response format for the current research. It can optimally highlight change in the latent variable. While this would also be possible in other response formats (i.e., Thurstone Scaling, Guttman Scaling, or binary options) these would not be able to indicate the same nuances of change which can be extremely valuable and important when measuring beliefs and attitudes. Additionally, it is important to consider whether to choose an odd or even number of discrete responses. Seven-point Likert-type scale have been shown to give participants optimal flexibility to correctly rate the intensity of agreement (Colton & Covert, 2007). This allows to adequately discriminate variances in the latent variable and is typically only possible with five to ten response options (DeVellis, 2012). Furthermore, it allows participants a central position without forcing them to commit in either direction. Neither format has been shown to be superior (DeVellis, 2012). When using Likert-type scales “reliability and validity can be significantly improved if all points on the scale are labeled with words, because they clarify meanings of the scale points” (Krosnick, 1999, p. 544). In addition, participants are generally more satisfied when response formats include verbal labels for all points (e.g., Dickinson, & Zellinger, 1980).

It should also not be neglected that the ordering of the response format (i.e., whether positive or negative dimensions are presented first or last) can have an influence on participants’ scores (i.e., response order effects). Researchers have found that for rating scales primacy effects (i.e., response choices presented early were most likely to be selected) were dominant compared to recency effects (i.e., response choices presented late were most likely to be selected; e.g., Chan, 1991; Johnson, 1981). Krosnick (1999) proposed that this is due to rating scales typically being considered sequentially. Thus, “the responded may select the first one that falls in his or

her latitude of acceptance... because people probably quickly consider each response alternative in order in which they are read” (Krosnick, 1999, p. 552).

#### **Phase 4: Pretesting**

Fourth, the initial item pool should be reviewed by experts in the respective field of interest. This can help to maximize the instrument’s content validity, which is more challenging “when measuring attributes such as beliefs, attitudes, or dispositions because it is difficult to determine exactly what the range of potential items is and when the sample of items is representative” (DeVellis, 2012, p. 60). Therefore, it is even more important to have the conceptual definitions of the construct of interest that were created in previous steps reviewed for their accuracy. This helps to establish that the phenomena are adequately represented by the scale. Similarly, the individual items should be evaluated which can offer valuable additional insight to their content validity and thus further maximize item appropriateness (i.e., clarity and conciseness). This process helps to identify items that lack clarity or that may be interpreted differently than the researcher intended. Furthermore, experts can potentially suggest additional ways or particular items that could be utilized to more comprehensively explore the construct of interest. Colton and Covert (2007) offered sample questions that can be utilized for pretesting:

- (1) Was each set of directions clear (that is, the general directions at the beginning of the questionnaire and any subsequent directions provided in the body of the instrument)?; (2) Were there any spelling or grammatical problems? Were any items difficult to read due to sentence length, choice of words, or special terminology?; (3) How did the reviewer interpret each item? What did each question mean to them?; (4) Did the reviewer experience problems with the item format(s), or does the reviewer have suggestions for alternative formats?; (5) Were the response alternatives appropriate for each item?; (6)

What problems did the reviewer encounter as a result of the organization of the instrument, such as how items flowed?; (7) On average, how long did it take to complete? What was the longest time and what was the shortest time it took to complete the instrument?; (8) For Web-based instruments, did the respondent encounter any problems accessing the instrument from a computer or navigating the instrument once accessed?; (9) Did any of the reviewers express concern about the length of the instrument, or did they report problems with fatigue due to the time it took to complete?; (10) What was the reviewer's overall reaction to the questionnaire?; (11) Did they have any concerns about confidentiality or how the questionnaire would be used?; (12) Did they have any concerns?; (13) What suggestions do they have for making the questionnaire or individual items easier to understand and complete?

### **Phase 5: Validating Initial Item Pool**

Fifth, to further validate the initial item pool additional validation indicators or tests can be included when administering the scale. In this process there are two types of supplementary items that can be considered. For example, tests such as the social desirability scale (Strahan & Gerbasi, 1972) can detect flaws or problems with the current version of the instrument. In addition, providing participants with scale that measures a theoretically related construct can enhance construct validity, since individuals' responses should be comparable (DeVellis, 2012). In other words, "if theory asserts the phenomenon you are setting out to measure relates to other constructs, then the performance of the scale vis-à-vis measures of those other constructs can serve as evidence of its validity" (DeVellis, 2012, p. 102).

## **Phase 6: Data Collection**

Sixth, now that an initial validity assessment has been completed in phase 4 and 5 the item pool should be administered to a development sample. This process is used to further construct the scale and enhance the adequacy of its items. The data that can be gathered from the development sample will subsequently be used to evaluate and finalize the scale in phase 7 and 8. To collect acceptable data a sufficiently large sample should be utilized. While there is no definite number, approximately 300 participants is typically regarded as an acceptable sample size (Comfrey & Lee, 1992; Nunnally, 1978). Tinsley and Tinsley (1987) proposed that a ratio of about five to ten participants per item is adequate up to a sample of 300 at which the ratio can be relaxed. Another alternative option is to determine the required sample size through a power analysis (i.e., the likelihood of rejecting a false null hypothesis). This route evaluates the probability to detect a parameter estimate that significantly differs from zero (Brown, 2015). Thus, the most useful technique is to run a Monte Carlo analysis in which hypothesized population parameters are generated. Data is then randomly created to replicate these parameters, samples are taken from these population data, and averaged across samples (Kline, 2011). There are also valid and reliable tests that have been successfully developed with smaller samples (DeVellis, 2012); however, researchers should be careful when using a small number of participants. Results may not be stable across different samples or be representative of the population. This is important because a representative sample allows for findings to be generalized to the overall population of interest (Krosnick, 1999) and leads to stable loadings (Cliff, 1970). In addition, larger samples usually decrease errors and increase the accuracy of population estimates. While these issues can arise with a sample of any size they are more likely with a small number of participants. Overall, while there are multiple suggestions there is no set

number or ratio that guarantees the generalizability, especially when “the number of items per factor and communalities and item loading magnitudes can make any particular ratio overkill or hopelessly insufficient” (Osborne, 2014, p. 47).

### **Phase 7: Data Analysis**

Seventh, in what DeVellis (2012) considers “the heart of the scale development process” (p. 104) the results which were gained in phase 6 need to be statistically examined to carefully evaluate the individual items. There are several statistical methods that can be used to examine the psychometric properties of the measure (i.e., Exploratory Factor Analysis, Principal Component Analysis, Cronbach’s alpha, Confirmatory Factor Analysis). However, before employing these methods there is a list of preliminary analyses that can assess the items’ performance. For example, individual items should be highly intercorrelated and simultaneously correlate with the collection of all remaining items (i.e., item-scale correlation; DeVellis, 2012). The item-scale correlation can be evaluated for each item including (i.e., uncorrected) or excluding (i.e., corrected) itself. DeVellis (2012) suggested that the corrected item-total correlation is advisable as it is a more accurate representation of the scale. In addition, there should be a relatively high variance of item scores which indicates that the development sample was diverse in regard to the construct of interest. Mean results for each indicator should further be close to the center of the range on the response format. Otherwise the items may not adequately detect the range of potential values for the latent variable (DeVellis, 2012). This is important as on a 7-point Likert-type scale such as the one utilizing in the current scale “a piling up of scores at the value 7, for example, would suggest that the item was not worded strongly enough (i.e., that it was rare to find anyone who would disagree with it)” (DeVellis, 2012, p. 107).

As previously mentioned scale development entails creating items that correspond to the intended level of variable specificity (DeVellis, 2012). Factor analysis can be utilized to check whether this has been successful. This method can accomplish multiple objectives but in essence helps to determine that number of constructs or latent variables that are represented by a set of items (DeVellis, 2012). Thus, the primary purpose is to establish the appropriate number of items that should be included in a scale. In this process factor analysis can help to condense information by potentially combining item scores and also eliminate those items that perform poorly. While this reorganization process can be conducted without employing statistical methods there is typically a limited amount of objectivity in these approaches. Factor analysis can be exploratory or confirmatory in nature. Both are based on the common factor model and are supposed “to determine the number and nature of latent variables or factors that account for the variation and covariation among a set of observed measures, commonly referred to as indicators” (Brown, 2015, p. 10). The difference is that the Confirmatory Factor Analysis (CFA) simply confirms theoretically preconceived patterns of relationships while the Exploratory Factor Analysis (EFA) identifies factors with no such preconception. In the development of the current scale both methods will be utilized to establish validity from a theoretical and practical perspective.

EFA begins by determining how many categories (i.e., factors) are necessary to adequately represent the information that is contained in the set of items. A factor is “an unobservable variable that influences more than one observed measure and that accounts for the correlations among these observed measures” (Brown, 2015, p. 10). For scale development this indicates which items are intercorrelated because they share the same common cause (i.e., latent variable). Thus, this extraction reduces the number of dimensions that are actually being

analyzed and therefore attempts to create a more parsimonious set of indicators. In this process there is no predetermined number of factors. The analysis rather begins with one single category to assess its effectiveness in representing all items. This single-concept premise is initially evaluated and then an additional factor is added if necessary. This procedure continues until researchers find an acceptable amount of covariation within the factors (DeVellis, 2012).

There are various extraction methods to determine the number of factors in a scale. Many statistical computing packages use Principal Component Analysis (PCA) as the default setting. However, Osborne (2014) suggested that this was bad practice and argued that Maximum Likelihood (ML) extraction should be considered the best choice when data exhibit multivariate normality. Hoyle (2000) shared this sentiment and even suggested that the use of any other estimation methods requires explicit justification. ML represents an iterative process that attempts to maximize the population correlation matrix (i.e., maximize the likelihood that the data was drawn from the population; Kline, 2011). “A key advantage of the ML estimation method is that it allows for a statistical evaluation of how well the factor solution is able to reproduce the relationships among the indicators in the input data” (Brown, 2015, p. 19). When normality assumptions are violated Principal Axes Factor (PAF) extraction should be utilized. Regardless of the extraction method researchers need to be careful to avoid overfactoring (i.e., including too many factors with potentially limited theoretical value) or underfactoring (i.e., including too few factors and resulting in false factor loadings). Thus, a decision needs to be made how many factors to extract and retain.

A statistical criterion can help in this process as it “determines whether the likelihood of a particular result is sufficiently small to rule out its chance occurrence” (DeVellis, 2012, p. 127). Hence, it is an indicator that helps to continue adding factors until an exhaustive number has



been found. The Kaiser Criterion is frequently the default selection criteria but has been shown to be the least accurate method for factor retention (Velicer, Eaton, & Fava, 2000). Parallel analysis compares eigenvalues (i.e., the amount of information captured by a factor) from the EFA to randomly generated data. This is often regarded as the most robust and accurate extraction method (Ledesma & Valero-Mora, 2007; Velicer et al., 2000). Parallel analysis can be further supported by the scree test which examines the graph of the eigenvalues to determine the adequate number of factors. In addition to these statistical methods researchers often prefer a parsimonious account of factors which is the smallest but most influential number rather than every possible option. Consequently, any analysis should be theory driven, which needs to be considered different than using predetermined factor structures. It rather controls that the factors revealed by the EFA have substantive value and can be interpreted. EFA is supposed to make meaning of data and thus should make sense when evaluated through a conceptual lens.

Results from a factor analysis are generally difficult to interpret. Therefore, once the number of factors has been identified rotation can enhance the interpretability by identifying clusters of items that represent a single latent variable (DeVellis, 2012). This procedure takes rather meaningless mathematical abstractions and offers a vantage point (i.e., a particular factor) from which to interpret them. Since the location of the axes are arbitrary (Thompson, 2004) rotating them does not meaningfully influence the results but indicates which underlying factor to assign the data to. This is done in an attempt to obtain a simple structure which refers to the solution in which “(1) each factor is defined by a subset of indicators that load highly on the factor; and (2) each indicator has a high loading on one factor and has a trivial or close to zero loading on the remaining factors” (Brown, 2015, p. 27). Orthogonal rotation, which maintains a 90 degree angle between axes and thus generates uncorrelated factors, is a common rotation

method. In contrast, oblique rotation (i.e., permitting a different angle than 90 degrees) allows the factors to correlate (Osborne, 2014). Traditionally, most researchers have utilized orthogonal rotations as they are easier to calculate, results are easier to interpret, and they are generally the default setting in statistical computing packages (Osborne, 2014). When factors are uncorrelated orthogonal (e.g., Varimax, Quartimax, and Equimax) and oblique (e.g., Promax) rotation will typically produce almost similar results (Brown, 2015; Osborne, 2014). However, when the assumption of correlation is violated the oblique solution will produce more trustworthy findings (Osborne, 2014) and a more realistic representation of how factors are related (i.e., magnitude; Brown, 2015).

As previously mentioned, PCA is often the default extraction technique in most statistical computing packages. Thus, it is another dimension reduction analyses that is frequently utilized by researchers and unfortunately often falsely assumed to be part of EFA. However, when using PCA researchers need to be aware that this analysis does not consider items as mere hypothetical variables of the construct of interest (Osborne, 2014). In addition, PCA expects that variables can be measured without error and parameters are selected to represent sample rather than population characteristics (Thompson, 2004). “When the factors are uncorrelated and communalities are moderate, PCA can produce inflated values of variance accounted for by the components” (Osborne, 2014, p. 3). Since the current instrument will be developed to assess the latent variables of autonomy-supportive behavior, structure, and involvement rather than the individual scale items EFA was deemed more appropriate. Furthermore, Floyd and Widaman (1995) argued that due to their shared foundation (i.e., the common factor model) results from EFA are more likely to generalize to CFA.

Once the initial dimensions have been established through EFA their performance can be tested assessing Cronbach's (1951) coefficient alpha ( $\alpha$ ). Once EFA has identified the factors that are formed by a scale's items alpha helps to decide how well these constructs are measured. It further indicates whether all items are necessary to accurately measure the constructs. Consequently, alpha has widely been accepted as a measure of reliability and serves as another method to eliminate poor items. Since it is often difficult to administer the same scale to the same sample and variable may actually change this is considered a more accurate measure of reliability as test-retest. Specifically, alpha indicates the proportion of variance for an observed value that represents the true score (i.e., signal).

$$\alpha = 1 - \sigma_e^2$$

Alpha can range between 0.0 and 1.0 and while there is not an agreed upon standard for satisfactory values Nunnally (1978) suggested .70 as an acceptable lower bound. DeVellis (2012) proposed a similar range which deems, "below .60, unacceptable; between .60 and .65, undesirable; between .65 and .70, minimally acceptable; between .70 and .80, respectable; between .80 and .90, very good; and much above .90, one should consider shortening the scale" (p. 109).

While researchers have widely accepted Cronbach's alpha as a measure for reliability the measure also has its limitations. Explicitly, rather than an ideal indicator of reliability it can usually only be considered a mere lower bound (DeVellis, 2012). Nevertheless, since alpha has been utilized so frequently and within various fields there are established standards for this measure (e.g., DeVellis, 2012; Nunnally, 1978). Thus, even if alpha can be considered a conservative measure other methods only yield different numerical values but do not change the reliability of the scale. In addition, alpha has a strong conceptual link to the definition of

reliability and various other indicators. Therefore, it may not be ideal and work continues on alternative measures the benefits of alpha still outweigh potential limitations. Lastly, it is important to note that alpha assumes that all items contribute equally to a scale's score. As this is often not the case researchers have to be okay with violating this assumption when using alpha (DeVellis, 2012).

While initial reliability has now been assessed it is important to keep in mind that EFA “is not a mode for testing of hypothesis or confirming ideas” (Osborne, 2014, p. 54). It is rather an exploratory method that offers an initial understanding of the data. Thus, once an initial factor structure has been established through EFA and alpha, CFA should be used to examine whether factor structures are consistent across different samples (Osborne, 2014). Due to time constraints this step will not be part of the current research. CFA and EFA are both grounded in common factor analysis and thus utilize many of the same procedures. In the current research the data that has been collected in phase 2 will be utilized for the CFA. In contrast to EFA, CFA requires the researcher to specify all aspects of the model prior to the analysis. In general it is utilized to verify factors and factor loadings (Brown, 2015). The number of factors indicates the number of subscales while factor loadings indicate how these should be scored.

In CFA researchers typically explore more parsimonious solutions than in other methods. Prior to the analysis there are two main rules to adhere to: the three-indicator rule (i.e., a single factor model has at least three indicators) and the two-indicator rule (i.e., a model with two or more factors has at least 2 indicators per factor; Kline, 2011). This again highlights the importance of creating multiple items for each construct of interest. Ideally, the factor structure has already been pre-determined through the EFA. Therefore, latent variables need to be scaled. However, since these are unobservable the units need to be set by the researcher. This can be

done by either setting the metric of the latent variable to be the same as the indicator or to a specific value (typically 1.0; Brown, 2015). In general, “the objective of CFA is to obtain estimates for each parameter of the measurement to produce a predicted variance-covariance matrix that resembles the sample variance-covariance matrix as closely as possible” (Brown, 2015, p. 62). Thus, the difference between these matrixes needs to be minimized.

“One reason why ML is widely used in CFA model estimation is that it possesses desirable statistical properties such as the ability to provide standard errors for each of the model’s parameter estimates” (Brown, 2015, p. 64). Once the parameters have been established the significance of the analyses needs to be determined. In this process it is best practice to utilize several goodness-of-fit indices (Brown, 2015). Thus, the standardized root mean square residual (SRMR; i.e., absolute fit), root mean square error of approximation (RMSEA; Steiger & Lind, 1980; i.e., parsimony correction), comparative fit index (CFI; Bentler, 1990; i.e., comparative fit), and Tucker-Lewis index (TLI; Tucker & Lewis, 1973; i.e., comparative fit) should be reviewed. This should be done as each fit class provides different information about the fit of the solution (Brown, 2015). There is limited consensus in regard to appropriate cutoffs for these indices but Hu and Bentler (1999) who offered guidelines based on stimulation studies. Hu an Bentler (1999) suggested that reasonably good fit is accomplished when “(1) SRMR values are close to .08 or below; (2) RMSEA values are close to .06 or below; and (3) CFI and TLI are close to .95 or greater” (Brown, 2015, p. 74). However, these indices produce a descriptive indication and thus residuals and modification indices can additionally be used to identify focal areas of misfit. It is not necessary to rotate results in CFA because factors have been pre-specified in a simple structure (Brown, 2015). Ultimately, factor loadings estimate the influence of factors on the individual indicators. For example, if a given factor loading is 4.0 this

indicates that a one point difference in the factor will lead to a four point difference in the associated indicator (Kline, 2011). Following EFA, Cronbach's (1959) alpha, and CFA procedures a scale has been developed that includes a reliable factor structure.

### **Phase 8: Final Analyses**

Eight, based on the instruments evaluation the scale length can be adjusted and optimized. In doing so researchers need to find the "optimal trade-off between brevity and reliability" (DeVellis, 2012, p. 110). While as initially indicated a large number of items can increase reliability dropping those with lower-than-average performance will increase alpha. In conclusion, by following DeVellis' (2012) eight steps scales can be developed that control for the instrument's psychometric properties. Therefore, a test can be constructed that is capable of measuring the phenomenon of interest and do so accurately.

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## **Appendices**



## **Appendix A: Initial Recruitment Email**

Dear Coach,

Literature in the field of sport psychology suggests that optimal motivation leads to increased performance, lower performance-related anxiety, increased well-being, higher levels of intrinsic motivation, and improved persistence when faced with adversity. As a coach you are in an ideal position to enhance athletes' motivation. Thus, the purpose of this project is to obtain a clearer picture of NCAA Division I, II, and III coaches' beliefs and attitudes toward the effectiveness of various practice behaviors.

**Thus, we would appreciate if you would complete the following survey. Please also forward this email or the survey links to other coaches on your staff.**

**[https://utk.co1.qualtrics.com/SE/?SID=SV\\_2lc762n9Eo39S0B](https://utk.co1.qualtrics.com/SE/?SID=SV_2lc762n9Eo39S0B)**

The web-based survey we have developed **can be completed in about 10 minutes**. Any information you provide will be kept confidential. Any publications or presentations resulting from this project will report summary statistics only.

If you have any questions about the survey, please e-mail Joe Raabe, doctoral candidate, Sport Psychology and Motor Behavior, University of Tennessee (jraabe@vols.utk.edu) or Dr. Rebecca Zakrajsek, Assistant Professor of Sport Psychology, University of Tennessee (raz@utk.edu).

Thanks in advance for your thoughtful consideration of this request. We would appreciate your completion of the survey within the next week.

Best,

**Joe Raabe, M.S.**

Doctoral Candidate, Sport Psychology and Motor Behavior  
Graduate Teaching Associate  
Chancellor's Research Assistantship Recipient  
Applied Sport Psychology Lab  
Department of Kinesiology, Recreation, and Sport Studies  
University of Tennessee  
E-Mail: jraabe@vols.utk.edu

## **Appendix B: First Follow-up Recruitment Email**

Dear Coach,

This is a follow-up email. **We would appreciate it if you would participate in our survey, if you have yet to complete it. Please also forward this email or the survey links to other coaches on your staff.** We greatly appreciate your assistance.

Literature in the field of sport psychology suggests that optimal motivation leads to increased performance, lower performance-related anxiety, increased well-being, higher levels of intrinsic motivation, and improved persistence when faced with adversity. As a coach you are in an ideal position to enhance athletes' motivation. Thus, the purpose of this project is to obtain a clearer picture of NCAA Division I, II, and III coaches' beliefs and attitudes toward the effectiveness of various motivational behaviors.

**Thus, we would appreciate if you would complete the survey:**

**[https://utk.co1.qualtrics.com/SE/?SID=SV\\_2lc762n9Eo39S0B](https://utk.co1.qualtrics.com/SE/?SID=SV_2lc762n9Eo39S0B)**

The web-based survey we have developed **can be completed in about 10 minutes**. Any information you provide will be kept confidential. Any publications or presentations resulting from this project will report summary statistics only.

If you have any questions about the survey, please e-mail Joe Raabe, doctoral candidate, Sport Psychology and Motor Behavior, University of Tennessee (jraabe@vols.utk.edu) or Dr. Rebecca Zakrajsek, Assistant Professor of Sport Psychology, University of Tennessee (raz@utk.edu).

Thanks in advance for your thoughtful consideration of this request. We would appreciate your completion of the survey within the next week.

Best,

**Joe Raabe, M.S.**

Doctoral Candidate, Sport Psychology and Motor Behavior  
Graduate Teaching Associate  
Chancellor's Research Assistantship Recipient  
Applied Sport Psychology Lab  
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University of Tennessee  
E-Mail: jraabe@vols.utk.edu

### Appendix C: Second Follow-up Recruitment Email

Dear Coach,

We have previously contacted you and invited you to participate in our online survey. The survey is anonymous and it is therefore impossible for us to know whether you have already participated. Thus, if you have already done so we greatly appreciate your assistance and we would like to apologize for this final follow-up! If you have yet to complete the survey we would like to take one final opportunity to invite you to participate. **Also, we have only received a limited number of responses from assistant coaches up and therefore would greatly appreciate if you would also forward this email or the survey links to other coaches on your staff!**

Survey link:

**[https://utk.co1.qualtrics.com/SE/?SID=SV\\_2lc762n9Eo39S0B](https://utk.co1.qualtrics.com/SE/?SID=SV_2lc762n9Eo39S0B)**

Literature in the field of sport psychology suggests that optimal motivation leads to increased performance, lower performance-related anxiety, increased well-being, higher levels of intrinsic motivation, and improved persistence when faced with adversity. As a coach you are in an ideal position to enhance athletes' motivation. Thus, the purpose of this project is to obtain a clearer picture of NCAA Division I, II, and III coaches' beliefs and attitudes toward the effectiveness of various motivational behaviors.

The web-based survey we have developed **can be completed in about 10 minutes**. Any information you provide will be kept confidential. Any publications or presentations resulting from this project will report summary statistics only.

If you have any questions about the survey, please e-mail Joe Raabe, doctoral candidate, Sport Psychology and Motor Behavior, University of Tennessee (jraabe@vols.utk.edu) or Dr. Rebecca Zakrajsek, Assistant Professor of Sport Psychology, University of Tennessee (raz@utk.edu).

Thanks in advance for your thoughtful consideration of this request. We would appreciate your completion of the survey within the next week.

Best,

**Joe Raabe, M.S.**

Doctoral Candidate, Sport Psychology and Motor Behavior  
Graduate Teaching Associate  
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## Appendix D: Instruments

### Initial Belief Items

The following items are related to coaches' interactions with athletes **DURING PRACTICE**.

For each item, please indicate how much you agree with the statement on a scale from 1

(*completely disagree*), 2 (*disagree*), 3 (*somewhat disagree*), 4 (*neither agree nor disagree*), 5

(*somewhat agree*), 6 (*agree*), to 7 (*completely agree*).

1. Providing athletes with opportunities to make meaningful choices enhances their motivation.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree
2. Offering athletes explanations for why tasks are done enhances their motivation.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree
3. Acknowledging athletes' feelings enhances their motivation.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree
4. Asking for athletes' input enhances their motivation.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree
5. Providing athletes with opportunities to take initiative and practice independently motivates them.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree

6. Making athletes feel guilty diminishes their motivation.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree
7. Communicating clear expectations motivates athletes.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree
8. Providing athletes with help and guidance through constructive feedback enhances their motivation.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree
9. Showing genuine interest in athletes' well-being beyond sport enhances their motivation.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree
10. Being there for athletes when they need me enhances their motivation.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree

The following items are related to coaches' interactions with athletes **DURING PRACTICE**.

For each item, please indicate how much you agree with the statement on a scale from 1

(*completely disagree*), 2 (*disagree*), 3 (*somewhat disagree*), 4 (*neither agree nor disagree*), 5

(*somewhat agree*), 6 (*agree*), to 7 (*completely agree*).

**ICAN...**

11. ... provide athletes with opportunities to make meaningful choices.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree
12. ... offer athletes explanations for why tasks are done.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree
13. ... acknowledge athletes' feelings.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree
14. ... ask athletes for their input.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree
15. ... provide athletes with opportunities to take initiative and practice independently.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree
16. ... avoid making athletes feel guilty.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree

17. ... communicate clear expectations.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree
18. ... provide athletes with help and guidance through constructive feedback.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree
19. ... demonstrate genuine interest in athletes' well-being beyond sport.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree
20. ... be there for athletes when they need me.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree

The following items are related to coaches' interactions with athletes **DURING PRACTICE**.

For each item, please indicate how much you agree with the statement on a scale from 1

(*completely disagree*), 2 (*disagree*), 3 (*somewhat disagree*), 4 (*neither agree nor disagree*), 5

(*somewhat agree*), 6 (*agree*), to 7 (*completely agree*).

**PEOPLE WHO ARE IMPORTANT TO ME THINK COACHES SHOULD...**

21. ... provide athletes with opportunities to make meaningful choices.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree
22. ... offer athletes explanations for why tasks are done.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree
23. ... acknowledge athletes' feelings.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree
24. ... ask athletes for their input.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree
25. ... provide athletes with opportunities to take initiative and practice independently.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree
26. ... not make athletes feel guilty.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree



27. ... communicate clear expectations.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree
28. ... provide athletes with help and guidance through constructive feedback.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree
29. ... demonstrate genuine interest in athletes' well-being beyond sport.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree
30. ... be there for athletes when they are needed.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree

The following items are related to coaches' interactions with athletes **DURING PRACTICE**.

For each item, please indicate how much you agree with the statement on a scale from 1

(*completely disagree*), 2 (*disagree*), 3 (*somewhat disagree*), 4 (*neither agree nor disagree*), 5

(*somewhat agree*), 6 (*agree*), to 7 (*completely agree*).

**COACHES I RESPECT...**

31. ... provide athletes with opportunities to make meaningful choices.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree
32. ... offer athletes explanations for why tasks are done.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree
33. ... acknowledge athletes' feelings.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree
34. ... ask athletes for their input.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree
35. ... provide athletes with opportunities to take initiative and practice independently.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree
36. ... do not make athletes feel guilty.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree

37. ... communicate clear expectations to athletes.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree
38. ... provide athletes with help and guidance through constructive feedback.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree
39. ... show a genuine interest in athletes' well-being beyond sport.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree
40. ... are there for athletes when they are needed.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree

### Behavior Items

For each item, please indicate how often you use the following behaviors when you interact with athletes **DURING PRACTICE** on a scale from 1 (*never*), 2 (*very rarely*), 3 (*rarely*), 4 (*sometimes*), to 5 (*often*), 6 (*very often*), to 7 (*always*).

1. I provide athletes with opportunities to make meaningful choices.						
1 never	2 very rarely	3 rarely	4 sometimes	5 often	6 very often	7 always
2. I offer athletes explanations for why tasks are done.						
1 never	2 very rarely	3 rarely	4 sometimes	5 often	6 very often	7 always
3. I acknowledge athletes' feelings.						
1 never	2 very rarely	3 rarely	4 sometimes	5 often	6 very often	7 always
4. I ask for athletes' input.						
1 never	2 very rarely	3 rarely	4 sometimes	5 often	6 very often	7 always
5. I provide athletes with opportunities to take initiative and practice independently.						
1 never	2 very rarely	3 rarely	4 sometimes	5 often	6 very often	7 always
6. I avoid making athletes feel guilty.						
1 never	2 very rarely	3 rarely	4 sometimes	5 often	6 very often	7 always

7. I communicate clear expectations with athletes.						
1 never	2 very rarely	3 rarely	4 sometimes	5 often	6 very often	7 always
8. I provide athletes with help and guidance through constructive feedback.						
1 never	2 very rarely	3 rarely	4 sometimes	5 often	6 very often	7 always
9. I show genuine interest in athletes' well-being beyond sport.						
1 never	2 very rarely	3 rarely	4 sometimes	5 often	6 very often	7 always
10. I am there for athletes when they need me.						
1 never	2 very rarely	3 rarely	4 sometimes	5 often	6 very often	7 always

## Demographic Items

1. How do you self-identify in regard to your gender? <input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Other: _____	
2. What is your current age? _____ Years	
3. How do you self-identify in regard to race? <input type="checkbox"/> White/Caucasian <input type="checkbox"/> African American <input type="checkbox"/> Asian/Pacific Islander <input type="checkbox"/> Hispanic/Latino <input type="checkbox"/> Native American/Eskimo/Aleut <input type="checkbox"/> Other: _____	
4. At what level do you coach? <input type="checkbox"/> Division I <input type="checkbox"/> Division III <input type="checkbox"/> Division II <input type="checkbox"/> Other: _____	
5. What is your current role as a coach? <input type="checkbox"/> Head Coach <input type="checkbox"/> Volunteer Coach <input type="checkbox"/> Associate Head Coach <input type="checkbox"/> Graduate Assistant Coach <input type="checkbox"/> Assistant Coach <input type="checkbox"/> Other: _____	
6. What is the primary sport you coach? _____	
7. What gender do you primarily coach? <input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Both	
8. Approximately how many athletes are on your team? _____ Athletes	

9. Overall, how many years have you been coaching at any level? _____
10. Overall, how many years have you been coaching at the collegiate level? _____
11. How many years have you been at your current job? _____
12. What is your highest level of academic achievement ____ High School/Secondary School ____ B.S. / B.A./ Undergraduate Degree/University Diploma ____ M.S. / M.A./MBA/ Master's Degree ____ Ph.D./Doctoral Degree ____ Other: _____
13. Do you have any formal training in coaching? _____ Yes _____ No If yes, please provide more information about your training: _____

### Open-ended item

13. Please provide any additional comments you may have regarding coaches' interactions with athletes <b><u>DURING PRACTICE</u></b> to enhance their motivation (optional).
---

### Appendix E: Final Coach Autonomy Support Beliefs Scale

The following items are related to coaches' interactions with athletes **DURING PRACTICE**.

For each item, please indicate how much you agree with the statement on a scale from 1

(*completely disagree*), 2 (*disagree*), 3 (*somewhat disagree*), 4 (*neither agree nor disagree*), 5

(*somewhat agree*), 6 (*agree*), to 7 (*completely agree*).

1. Providing athletes with opportunities to make meaningful choices enhances their motivation.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree
2. Offering athletes explanations for why tasks are done enhances their motivation.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree
3. Acknowledging athletes' feelings enhances their motivation.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree
4. I can offer athletes explanations for why tasks are done.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree
5. I can acknowledge athletes' feelings.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree
6. Coaches I respect acknowledge athletes' feelings.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree



7. Coaches I respect provide athletes with opportunities to take initiative and practice independently.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree
8. Coaches I respect do not make athletes feel guilty.						
1 completely disagree	2 disagree	3 somewhat disagree	4 neither agree nor disagree	5 somewhat agree	6 agree	7 completely agree

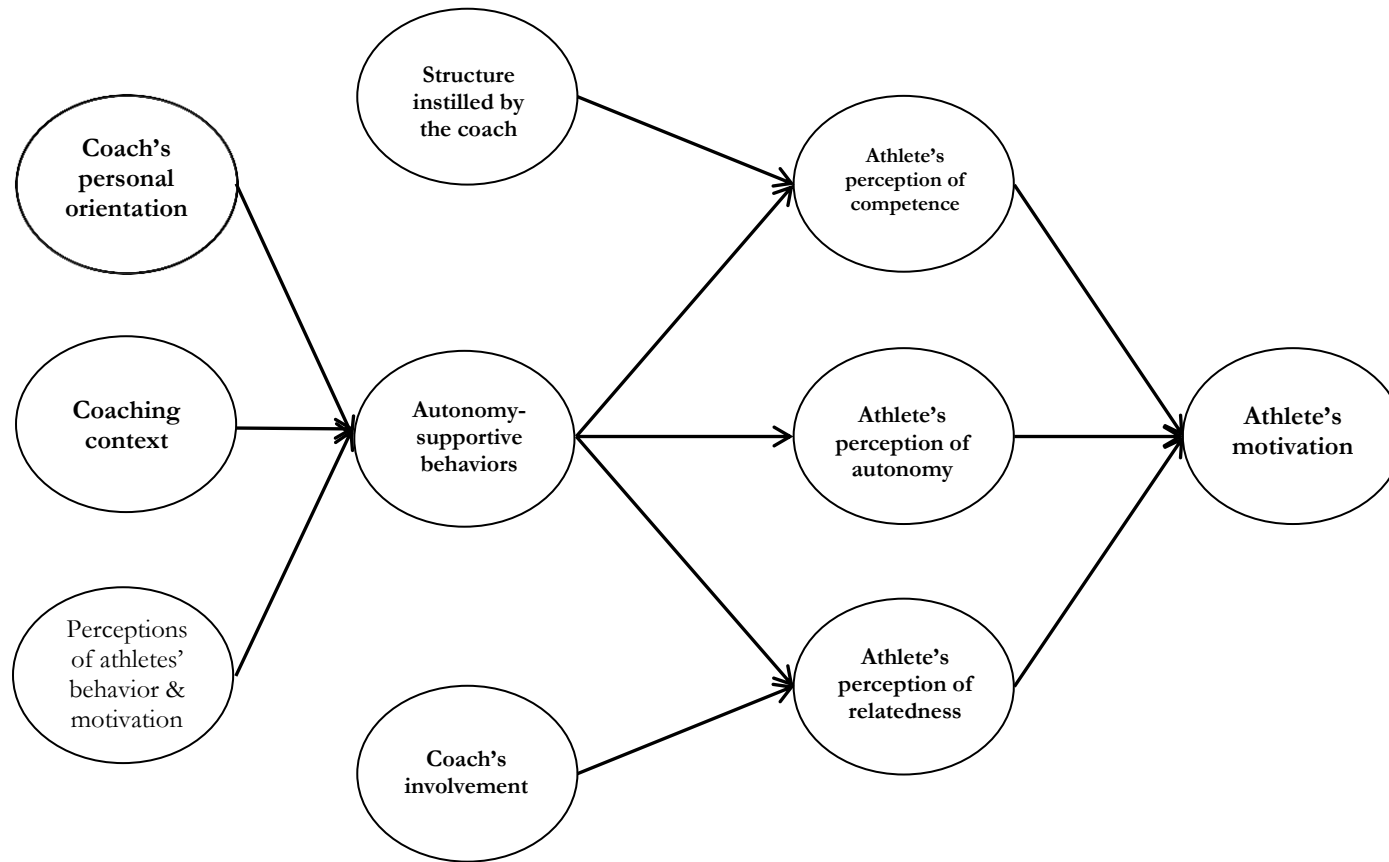
**Scoring:**

Personal belief: Item 1 + Item 2 + Item 3 + Item 4 + Item 5

Social influence: Item 6 + Item 7 + Item 8

### Appendix G: Most Relevant Definitions

1. *Attitude* is “a latent disposition or tendency to respond with some degree of favorableness or unfavorableness to a psychological object” (Fishbein & Ajzen, 2010, p. 76).
2. *Autonomy-supportive behaviors* entail that “an individual in a position of authority takes the other’s perspective, acknowledges the other’s feelings, and provides the other with pertinent information and opportunities for choice, while minimizing the use of pressures and demands” (Black & Deci, 2000, p. 742)
3. *Behavioral intention* is “the person’s estimate of likelihood or perceived probability of performing a given behavior” (Fishbein & Ajzen, 2010, p. 39).
4. *Involvement* entails showing a genuine interest and care in athletes on a personal level while providing a source of emotional support (Mageau & Vallerand, 2003).
5. *Structure* is the provision of clear directions, expectations, as well as strategies that optimally support athletes’ development and guide them towards the achievement of their objectives (Mageau & Vallerand, 2003).
6. *Perceived behavioral control* is “the extent to which people believe that they are capable of performing a given behavior, that they have control over its performance” (Fishbein & Ajzen, 2010, pp. 154-155) and entails having the necessary information, skills, opportunities, and resources to perform the behavior successfully and to overcome possible barriers or obstacles.
7. *Perceived norm* is the “perceived social pressure to perform (or not to perform) a given behavior” (Fishbein & Ajzen, 2010, p. 130) and are also referred to as strict rules, general guidelines, or empirical regularities.

**Appendix H: Figures and Tables**

*Figure 3.* Motivational Model of the Coach-Athlete Relationship (Adapted from Mageau & Vallerand, 2003)

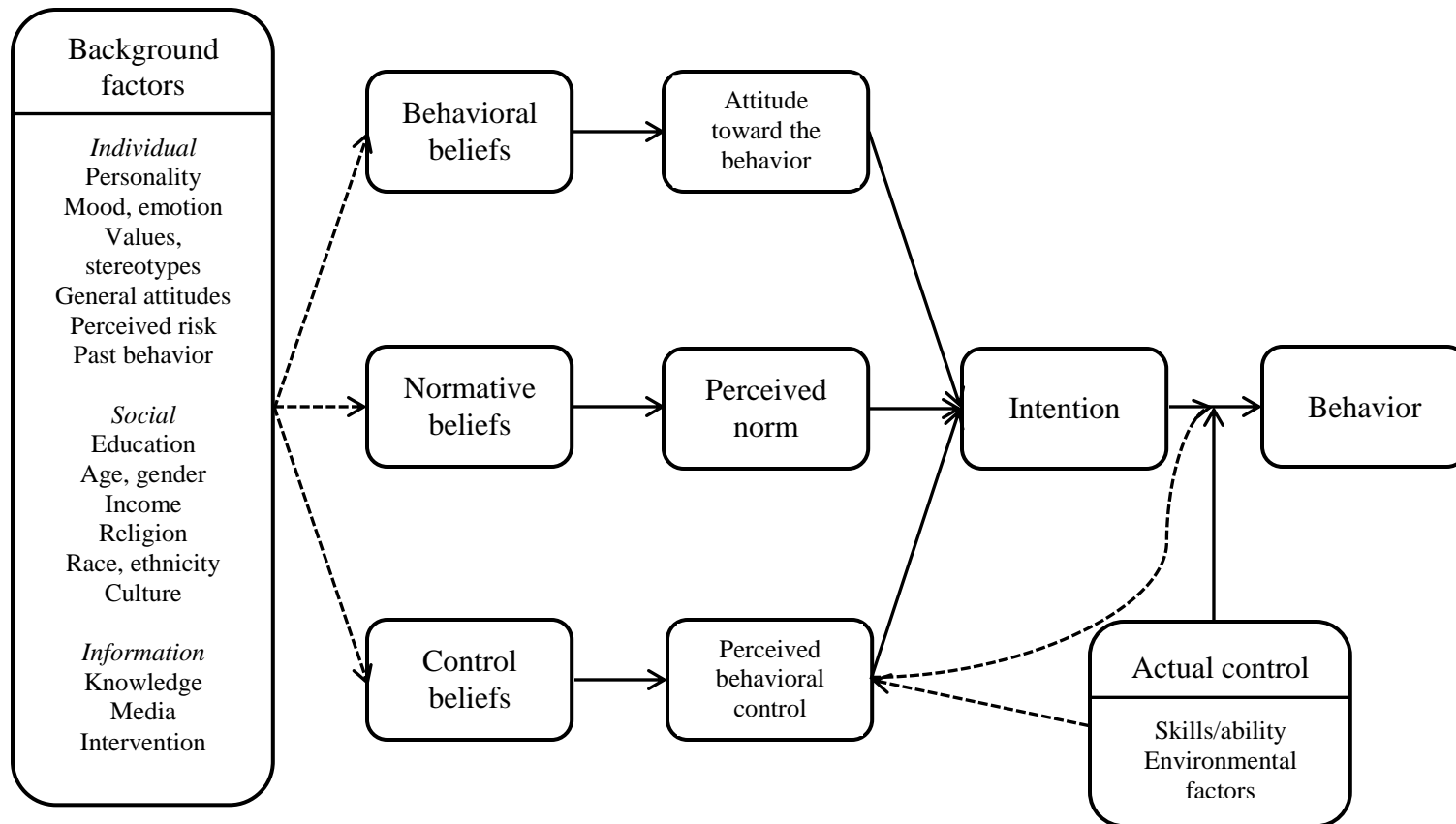


Figure 4. Reasoned Action Approach Model (Adapted from Fishbein & Ajzen, 2010)

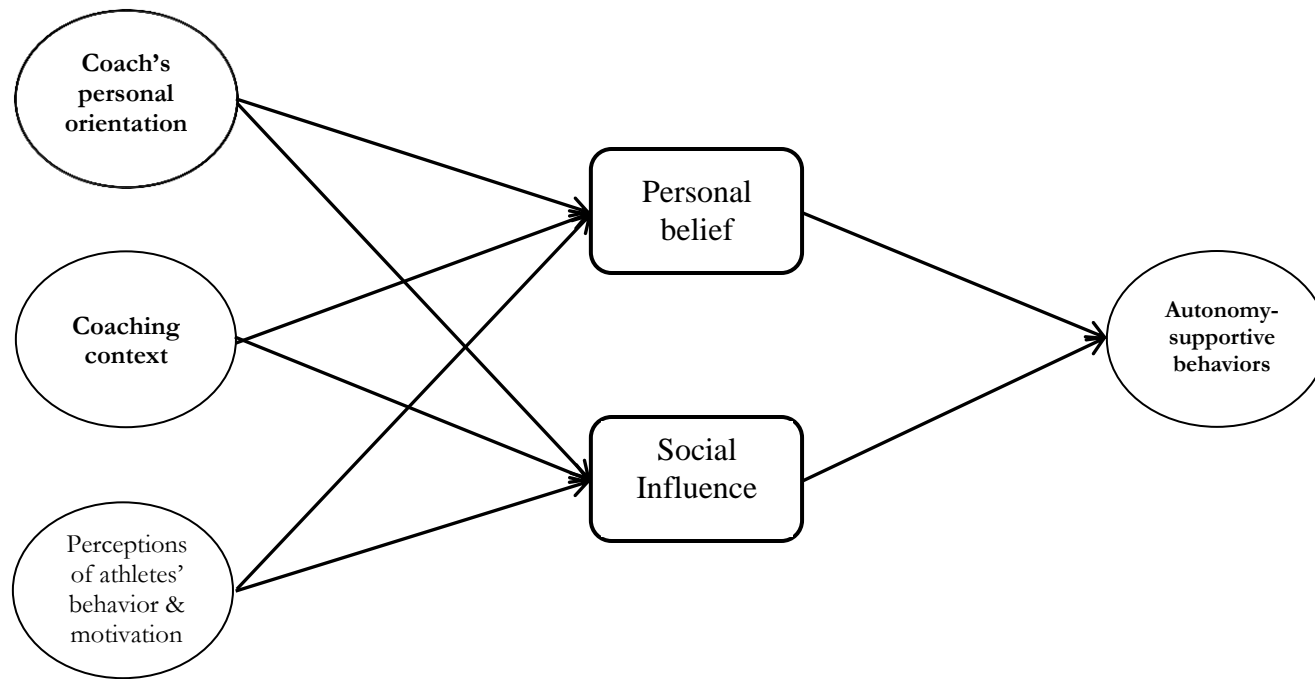


Figure 5. Beliefs toward Autonomy Support Model

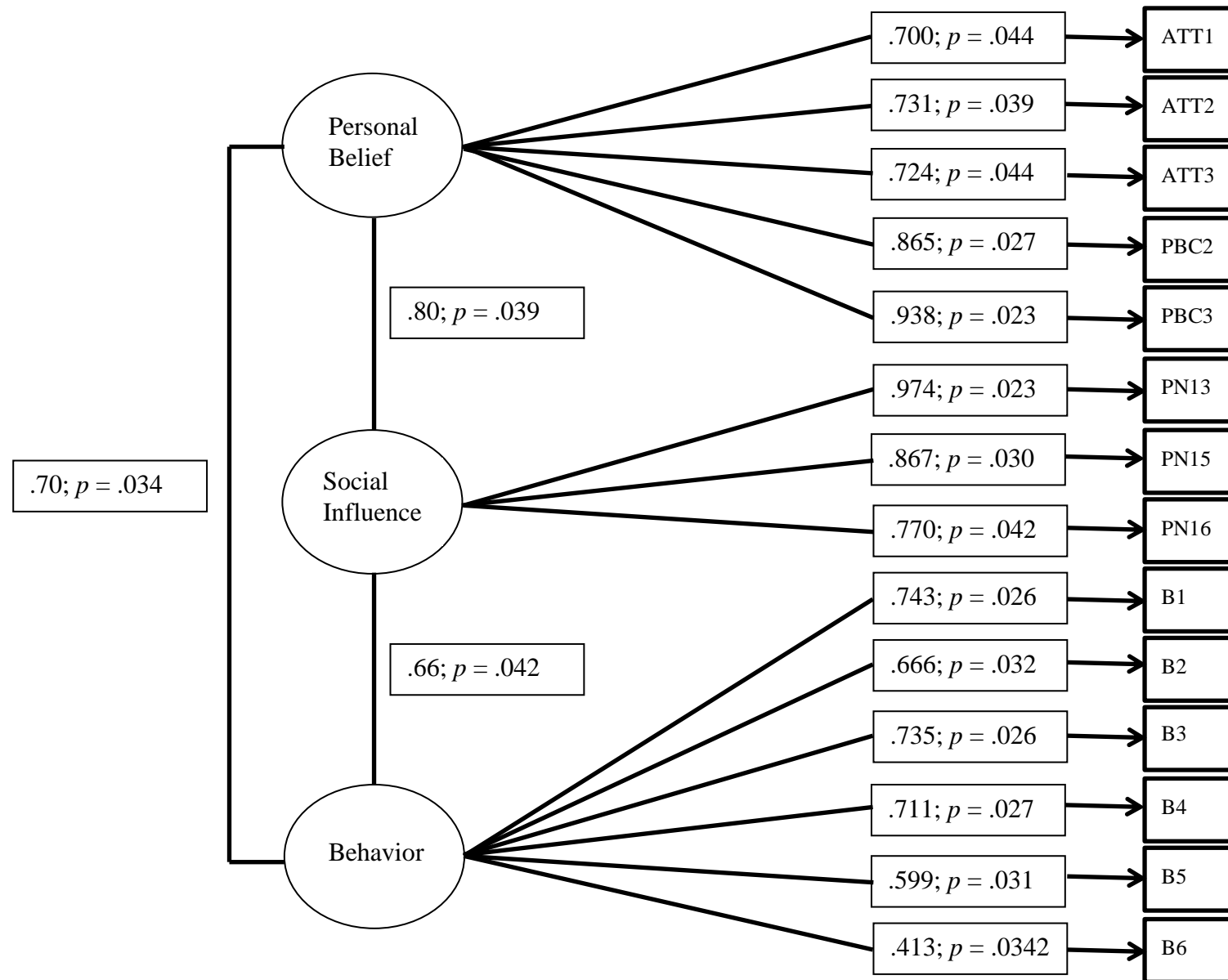


Figure 6. Personal Belief, Social Influence, and Behavior

Table 2

*Self Theories Comparison*

Main Concept	<i>Me-self / I-self</i>	<i>Self-Competence</i>	<i>Self-efficacy</i>	<i>Self-determination</i>	<i>The Physical Self</i>	<i>Self-understanding</i>	<i>The Multidimensional self-concept</i>	<i>Self-schema</i>	<i>Self-knowledge</i>
Reference/Theorist	James (1982)	Harter (2012)	Bandura (1997)	Deci & Ryan (2000)	Fox (1997)	Damon & Hart (1988)	Marsh (1990)	Lewis (1990)	Baumeister (1999)
Description	The I-self represents the individual (i.e., the actor or knower) and the Me-self includes constituents that define the self-as-known (e.g., material, social, and spiritual characteristics).	Self-perceptions are not just based on descriptive attitudes but also on more critical evaluations about individuals' adequacy in five different domains: scholastic competence, athletic competence, social acceptance, behavioral conduct, and physical appearance.	Individuals' level of conviction in their ability to engage in a behavior successfully will not only determine their effort, but typically also how long they persist when faced with adversity.	Human behavior is typically driven by motivation, which can come from a variety of different sources. Self-determined motivation is fostered through the satisfaction of the three basic psychological needs of competence, autonomy, and relatedness.	The physical self is individuals' perceptions of themselves in the physical domain. This includes multiple competencies and appearances such as perceptions of strength, endurance, sport ability, and body image.	Self-understanding is based on individuals' thoughts and attitudes about themselves. More specifically, self-understanding can be considered a cognitive self-organizer of experiences that provides continuity across possible fluctuations.	The self is a complex construct that needs to be understood in different contexts and consider its various facets.	Self-schema is the overall knowledge of individuals regarding themselves. In essence, this schema entails the following questions: "(1) Who am I? (2) What is my relationship to others? and (3) How do I feel about them?" (Lewis, 1990, p. 278).	Three major experiences build the foundation of selfhood: individuals experience reflexive consciousness, develop their self-concept to be able to relate to others, and experience the self in its executive functioning.

Table 2 Continued

Main Concept	<i>Me-self / I-self</i>	<i>Self-Competence</i>	<i>Self-efficacy</i>	<i>Self-determination</i>	<i>The Physical Self</i>	<i>Self-understanding</i>	<i>The Multidimensional self-concept</i>	<i>Self-schema</i>	<i>Self-knowledge</i>
Application to Sport Context		Self-Competence appears to be an important consideration within the athletic environment as athletes are typically asked to compete against others.	Self-efficacy appears to mediate the effects of environmental factors and prior accomplishments on subsequent behavior.	Athletes who were self-determined gave more effort, experienced lower levels of performance-related anxiety, and had higher levels of well-being in and out of sport compared to athletes who did not demonstrate self-determined motivation.	In a context that is centered around physical activity it appears reasonable to suggest that the physical self plays a fundamental role in the sport environment.	While individuals develop and change over time and are influenced by their interactions and relationships with others it at the very least seems questionable that there are not affected by earlier developments.	It seems reasonable to suggest that the self-concept varies depending on context (e.g., practice versus competition) and specific situations (e.g., morning versus afternoon practice). At a more general level, individuals' self-perceptions will likely differentiate based on the sport they engage in.	While it is unlikely that individuals engage in sport to acquire the ability to reproduce relationships are an important consideration with the athletic context. For example, the coach-athlete relationship has been shown to be an important determinant of athletes' experiences.	An emphasis on relationships and their influence in determining the self-concept appears to have some merit in understanding how individuals in the sport setting conceptualize the self.



Table 3

*Rotated Factor Loadings of Final Solution for Exploratory Factor Analysis (N = 497)*

	Factors	
	1	2
ATT1: Providing athletes with opportunities to make meaningful choices enhances their motivation.	.674*	.088
ATT2: Offering athletes explanations for why tasks are done enhances their motivation.	.732*	.005
ATT3: Acknowledging athletes' feelings enhances their motivation.	.901*	-.117
PBC2: I can offer athletes explanations for why tasks are done.	.812*	.000
PBC3: I can acknowledge athletes' feelings.	.663*	.191
PN13: Coaches I respect acknowledge athletes' feelings.	.286*	.601*
PN15: Coaches I respect provide athletes with opportunities to take initiative and practice independently.	-.008	.886*
PN16: Coaches I respect do not make athletes feel guilty.	.140	.686*

\* $p < .05$

Table 4

*Differences in NCAA Division I coaches' personal belief and social influence toward involvement in practice based on based on age, gender, race, gender of athletes they coach, number of athletes they coach, coaching experience, highest level of academic achievement, and formal training in coaching (N = 497)*

	Factor 1	Factor 2
	$\chi^2$	$\chi^2$
Gender <sup>1</sup>	.172	1.45
Age	36.08	43.73
Race <sup>2</sup>	.313	.926
Competitive level <sup>3</sup>	.820	.398
Gender of athletes they coach <sup>4</sup>	.196	.485
Number of athletes they coach	74.56	82.28
<b>Coaching experience</b>		
Total	42.40	58.60
In college	46.71	85.38***
In current job	64.47*	68.50**
Highest level of academic achievement <sup>5</sup>	1.11	.297
Formal training in coaching <sup>6</sup>	.317	1.21

<sup>1</sup>Male = 0<sup>2</sup>White/Caucasian = 0<sup>3</sup>NCAA Division I = 0<sup>4</sup>Male = 0

<sup>5</sup>M.S./M.A./MBA/Master's Degree = 0

<sup>6</sup>Yes = 0

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

### **Vita**

Johannes Raabe was born in Speyer, Germany on September 13, 1985. He is the son of Ruediger and Stefanie Raabe and has one younger brother Stefan Raabe. Johannes received his Bachelor's of Arts in Sport Science from the University of Mainz in Mainz, Germany in 2011. Then he attended the University of Wyoming in Laramie, Wyoming from 2011 to 2013 to obtain his Master's of Science in Kinesiology of Health under the guidance of Dr. Tucker Readdy. In 2013, Johannes started his doctoral studies in Sport Psychology and Motor Behavior at the University of Tennessee under the supervisions of his advisor Dr. Rebecca Zakrajsek. He received a Doctor of Philosophy from the University of Tennessee in May 2016.